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ABSTRACT

Papers collected in this book either discuss steps that might be taken to prepare students and teachers for the future, or speculate on what schooling, curriculum, and educational needs might be like in the next century. An introduction to the collection by Alberto M. Ochoa precedes the following papers: (1) "Creating a Desirable Education System" (Robert Theobald); (2) "The Future of Global Society" (Don Glines); (3) "New Age Ethics: Ethical Implications on Critical Future Issues" (Patricia W. Anderson); (4) "Socioeconomic Cultural Pluralism: Its Meaning for the Future and Education" (Bob H. Suzuki); (5) "The Information and Synergetics Revolution: Implications for Educational Leadership Change" (Linda Groff); (6) "Rethinking Educational Equity: Restructuring Education for an Information Society" (Shirley McCune); (7) "Education in the 1990s: A Demographic View" (Ernest F. Garcia); (8) "'Classroom' of the Future: 2058 AD" (Robert A. Cervantes and Celia Z. Castaneda); (9) "Career and Work in the 1990s: A Challenge to Our Present Educational Focus" (Janet Cameron Fisher); (10) "Global Societal Trends and the New Technology: Implications for Teacher Credentialing" (John F. Brown and Michael D. McKibbin); (11) "Alternative Graduation and Entrance Requirements: A Human Essential" (Don Glines); (12) "Student Human Potential: Going Beyond the Basics" (Sylvia Ann White); and (13) "Resources for the Future" (Don Glines). (KH)

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School of Education San Diego State University

EDUCATIONAL AND SOCIETAL FUTURES

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EDUCATIONAL AND SOCIETAL FUTURES:
MEETING THE TECHNOLOGICAL DEMANDS OF THE 1990'S

PROCEEDINGS OF CONFERENCE
HELD AT
ANAHEIM CONVENTION CENTER
APRIL 28, 1983

Dr. Alberto M. Ochoa
and
Dr. Juan Hurtado
Editors

Spring 1984

National Origin Desegregation Lau Center
San Diego State University

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INTRODUCTION

Alberto M. Ochoa

Presently, there are at least two opposing philosophies with respect to the future of our nation. These two perspectives are based on those who maintain faith in the American socioeconomic system amidst current social and technological transformation of the world versus those who see present societal and technological transformation as a clear sign that the values which carried the country through its first 200 years should be abandoned for a new approach. The clash between the two opposing philosophies will, no doubt, play a critical role in determining the shape of American society in the 1990's and beyond (Allen and Dede, 1979).

In the next twenty years, regardless of which of the above perspectives one tends to support, each must address the complexity of social, economic, political and equity problems that plague our nation in its efforts to operationalize the basic principles of our Constitution and the belief system that calls for "liberty and justice for all."

During the early 1980's, the American society has begun to dismantle legislative mandates that seek to correct past discriminatory practices based on the "separate but equal doctrine." While our government advocates for "human rights" around the world, American education at home has been extremely poor in providing equal educational opportunities for persons of different racial, sexual, cultural and linguistic origins

(U.S. Commission on Civil Rights, 1981). Despite years of of legal and legislative mandates to improve equity of access, of outcome, and of staffing, educational institutions continue to be discriminatory by omission and commission (Allen and Dede, 1979).

Specifically, as the State of California moves to become the only large industrial state with a numerical majority composed of ethnically diverse persons by 1990, and as our communities become more ethnic in number, the quality of education and institutional expectations towards ethnically diverse children diminishes (U.S. Commission on Civil Rights, 1978). Fewer students are provided with the necessary skills to enable them to enter college (Espinosa and Ochoa, 1984, in press). In the skill areas of reading and math, the California Assessment Program scores for 1977-1978 and 1980-1981, suggest that over 80 percent of the sixth grade Hispanic and Black children attending schools in California are underachieving and are below grade level (Espinosa and Ochoa, 1984, in press). The chances of attending college for these students are dismal, and they will have few skills to deal with the basic job requirements of the late 1980's and early 1990's.

Furthermore, financial, academic, and sociocultural support systems at the university level are increasingly lacking as schools and society fail to educate and to integrate (politically, economically, and socially) ethnically diverse students into the mainstream of society (Carter and McFadden, 1980).

Towards Equity in the 1990's

The challenges facing society, school districts and universities, as responsible institutions for preparing the professional agents of change, have been well documented by contemporary social commentators. Among the challenges and major issues facing national, state and our local communities in the next ten to 20 years are the following:

- As a nation and community of culturally and linguistically diverse people, will our national policy towards equity and cultural pluralism continue to be based on the principle of equal opportunity of access that promotes the deficit model, or will our nation begin to operationalize the principle of social-economic, political opportunity of benefits (Tesconi, 1974; Jowett, 1943; Pantoja, 1975; Cornoy, 1974; Suzuki, 1982)?

- As our society moves from traditional mass production industries, into four technological cluster related industries of electronics and computers, space industry, oceanics, and biological industry, how are institutions and schools reconceptualizing the necessary curricula to prepare our present and future students to acquire the skills to master these technologies (Toffler, 1980)?

- As our community becomes more culturally and linguistically diverse, how will political participation and horizontal distribution of power become more representative and foster community growth, cooperation and transformation (Ferguson, 1980)?

- As technology and information transform our nation, communities, and lives, how will our system of education respond to learning as a life long process and move from a hierarchical and authoritarian structure to one that is egalitarian, and sees students and teachers as people and not roles (Ferguson, 1980; Freire, 1970)?

- As the values of our nation and communities are transformed from a position of American cultural-economic-military dominance to one dependent on other governments for support, what role will our educational institutions play in promoting diversity of life styles, pluralism in values, and new economic constraints (Yankelovich, 1981)?

In responding to the above issues, a Conference on Educational and Societal Futures was held on April 28, 1983, in Anaheim, California. The objectives of the conference were to:

- Examine the ongoing technological transformation of our society.
- Analyze the role that education must play in addressing the global issues impacting society.
- Provide an awareness of critical future issues that affect language minority students.
- Suggest changes that school curricula need to address for all students to succeed in the 1980's and the 1990's.
- Review major future issues which impact teacher preparation and licensing to meet the social and educational demands of the future.

To operationalize the objectives, key presenters were invited to present papers on specific topics. The presenters were chosen from a large field of professionals who were active in addressing educational equity issues and directly involved with educational institutions in improving the quality of schooling experiences of students. The ideas of these professionals are captured in the 13 papers contained in this publication. The papers represent an initial step in the development of issues, concepts, and proposals for addressing the present educational practices being applied to the growing number of linguistically and culturally diverse student population in American society. They address the social and technological transforformation of our society in route to the 21st Century. Attention is likewise given to the need for global awareness on the part of U.S. society to the largely non-White population of planet Earth. Finally, the papers focus on the existing interdependence among the family of nations for global survival and a global-community view of the world.

The papers of the conference proceedings are divided into four areas and a resource guide. The work of Theobald, Glines, Anderson, and Suzuki address the need for a new socioeconomic, political and educational outlook, and consciousness for shaping the present transformation of our society and world in the direction that will yield a community of people and nations concerned with the quality of life for all people. Among the topics covered by these authors are:

- Education as a prime mover to prepare people to be successful in the communications era and in the 21st Century (Theobald).
- Education as a living resource to help preserve global ecological equilibrium and improve the quality of life of people (Glines).
- Ethical implications demarcating the New Age of technological transformation and the ethical imperative of the future (Anderson).
- Socioeconomic cultural pluralism, a multicultural conceptual framework for a democratic society, and the future of education (Suzuki).

The papers of Groff, McCune, and Garcia discuss policy and planning issues and approaches that state departments of education and school systems should consider in responding to educational reform and societal transformation. Among the issues presented by these authors are:

- The leadership role that education must take in the educational/learning function required of a rapidly changing, learning society in an information and synergetics age (Groff).
- Rethinking educational equity for an information society and the use of strategic planning as a process for restructuring education (McCune).
- Projecting demographic trends and planning for the future to influence outcomes (Garcia).

Schooling issues with respect to the curricula of the 21st Century, new careers, teacher credentialing, and graduation standards are issues addressed by Cervantes and Castaneda, Fisher, Brown and McKibben, and Glines. The four papers discuss the following issues:

- Curricula differentiation between the industrial and post-industrial eras (Cervantes and Castaneda).
- The role of educators and career education for the world of the future (Fisher).
- Future trends in teaching and technology, and teacher preparation and credentialing for the future (Brown and McKibben).
- Alternative graduation and entrance requirements for expanding human options as we enter the 21st Century (Glines).

The paper by White provides an overview of issues that educators must consider in implementing a holistic education. Among the issues presented are:

- Health factors that contribute and increase the human potential of the student.
- Self-knowledge of physiological and psychological reactions of the human body in responding to stress and anxiety, and for improving the intellectual potential of the self.

The last paper by Glines provides a brief guide to resources for the study of the future. The guide includes a list of key societal futures publications, educational futures publications, information groups, futures magazines, and classroom resources.

The above mentioned papers will assist the reader in re-examining our values and their implications to the social, economic, political, and educational institutions of our society in the midst of the technological and informational era confronting our world.

This re-examination of values must encourage a renaissance of hope in society and of pride in people's decision as to what our destiny will be as we press forward to actualize social equality and open the door to the 21st Century.

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CREATING A DESIRABLE EDUCATIONAL SYSTEM

Robert Theobald

In order to discuss education effectively, some understanding of the basic underlying purpose of education must be shared. Education, in its broadest sense, should prepare people to be successful in the world which will exist during their life span.

The current educational system was designed to prepare people to live in the industrial era. What did the industrial era require? It needed a well-disciplined factory and office labor force who would stay on the job, obey orders, and be as efficient as possible. Society needed people who believed that hierarchical systems were the ways to get things done: orders were, therefore, obeyed without question. Also needed was a situation where people would always have unsatisfied desires for goods and services so that they would not continuously quit their jobs as they gained *enough* money, as was often the pattern early in the nineteenth century.

As might be expected, the school was organized to function along the same lines as the rest of the industrial-era system. The teacher was the equivalent of the boss in the office and the factory: the teacher both knew what needed to be known and was responsible for maintaining order. Thus, the students, during school years, learned not only the basics which were essential for efficient work in the industrial era but also

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absorbed the styles of behavior which would stand them in good stead as they entered the labor force.

Today, it can be seen that the world of the future will work quite differently. First, one can understand that everything is connected to everything else: one must, therefore, learn to teach in interconnected ways. One can neither effectively study a subject nor act creatively without recognizing that all actions have consequences and that these consequences continue to reverberate through the socioeconomic system for indefinite periods of time. All too often the secondary and tertiary effects of decision making may contradict and annul the first intentions. To put it another way, there are very few points at which a decision will really change the direction of a society--many action patterns fail to be effective over time because the desired change cannot be achieved in the particular way that is tried.

Second, there is no such thing as truly objective analysis or action. Everybody is biased. Our biases emerge from our experience and different people will see the same situation differently. It is hopeless to strive toward an absolutely correct answer, for nobody is going to be willing to admit that their truth is wrong. It may be possible, however, to approach a broader vision on a gradual basis as people listen to others and learn new perceptions and ideas which they have previously ignored or not perceived at all.

Third, all action is risky. There are no certainties in life. One must always balance probabilities. Thus, there is no absolutely right or wrong set of actions. People with different personalities and styles of thinking will want to accept different levels of risk and challenge. Thus, for example, an individual may choose a project where the chance of success is only 60 percent and has high gains, as compared to a project with a 90 percent chance of success but far lower gains. It is unrealistic to blame the person for incorrect perceptions if the project eventually is unsuccessful because there was an accepted 40 percent chance of failure. Similarly, a person should not blame the self under these conditions.

If the world is interconnected, if objectivity is impossible and if risk is inevitable, we clearly need to teach people new patterns of thought, and also to teach them in new ways. This is the fundamental challenge which confronts education at all levels. It is not enough to make small modifications within current patterns. It is the overall patterns themselves which are making it impossible for us to provide children, and indeed adults, with the conceptual skills they require to understand the pattern of events which surround them in today's world.

The complexity of events continues to increase. Most people find themselves hopelessly confused by the pace and pattern of events in the world today. They will continue to be unable to make sense of their world so long as they try to analyze it within the industrial era models which they have been taught. These older models require that events be predictable, understandable, and unidimensional. One has to learn to operate with a far greater tolerance of ambiguity than has ever been the case in the past.

The Driving Forces

The need for a tolerance of ambiguity is reinforced by the rapidity of change in many areas. Among them:

Rich-Poor Country Tensions. It is obvious that the stress on the poor countries of the world has not yet reached its peak and that the relationships between the rich and the poor countries of the world must be expected to continue to worsen.

Past American Population Changes. The "bulge in the snake" phenomenon is only now beginning to get the attention it deserves. Few people understand how this will continue to disrupt the overall structure of the United States over the next 50 years.

Migration Factors. The migration from north to south is now well established and will almost certainly continue for most of the remainder of the century. The shift from urban to rural areas is only now taking hold and will, given people's desire to escape the cities, be very difficult to manage.

Land, Air, Water Constraints. Even though the environmental consciousness which developed in the 1960s and burgeoned in the early 1970s is under attack, the realities of the situation prevent any real cutbacks in commitments. Our environmental problems are sufficiently serious that they can threaten the long run health and safety of the population.

Energy/Resource Availability. While it may be possible to obtain enough resources for a long time into the future, costs will be higher. This different pattern of costs will force significant infrastructure shifts: it may be impossible to maintain all of the present capital stock. To take one example, the deteriorating road and bridge situation is becoming critical in many parts of the country.

Climate. There is much disagreement among meteorologists about this issue. The climate of most of the twentieth century has almost certainly been unusually benign and stable.

Telecommunications. The technology of telecommunications will continue to develop because there is no real opposition to it at the present time, although different groups hope that it will be used for different purposes. Telecommunications is the next revolutionary force, to be followed almost certainly by genetics.

All of these driving forces must be placed in the context of massive world wide instability and the real risk of World War III.

Skills for the Communications Era

What then are the primary skills that have to be taught if we are to be able to live in the society that has been created? There are at least five requirements. They cannot be listed in order of importance, for they are all required if people are to be prepared to live successfully in what can be called the communications era. The five requirements are as follows:

1. The need to help people gain the skills which will enable them to live happily and creatively with others in their communities. For this to be possible

we shall need to create a far greater diversity of communities then presently exists in America and to make it easier for people, as they grow and change, to move from community to community, where their skills can be used effectively. The availability of different languages which provide different windows on the world will help in this task.

2. The need to help people to be aware of their strengths and weaknesses and provide them with the information and knowledge which will enable them to chart a life course which will be satisfactory to them and supportive of the communities in which they choose to live. It is in this context that the idea of learning to learn--rather than learning a subject once and for all--is critical.
3. The need to teach people the ability to look at a defined situation and to make good decisions about the best ways to deal with that situation, while being aware of the interconnections with other areas of their lives as well as the patterns of risk involved in any decision making.
4. The need to teach people the ability to look at a situation and to produce imaginative and creative ideas about the ways in which that situation can be changed for the better so that all those involved in it have more chances of meeting their purposes and their goals.

5. The need to teach people the ability to distinguish between situations where it is wise to work within current realities and those that can only be resolved on the basis of creative thinking and significant change.

What implications do these requirements have for present patterns of education? Many of the following ideas have been around for many years but they have not affected significantly the momentum of the educational establishment. Hopefully, the meaning of these ideas will emerge far more clearly in the context of the previous discussion.

> Education must be life long; people must have the chance to continue to learn so long as they are alive. In a risky, uncertain, interconnected world, one can survive only if one continues to learn.

This goal is a common one and some progress has been made toward it. However, its full implications have not been understood for primary, secondary, and vocational education. The relatively rigid age grading that exists in the schools does not recognize the reality that each person may need to learn different subjects at different ages.

The sooner people of very different ages can learn together, the sooner can some of the pathologies be diminished which have emerged from confining young people largely to talking to people in their own age group. Why is there an unwillingness to mix young, middle-aged, and old people in the same learning situation? The answers are to be found in the vision of education as a carefully orchestrated progression of learning which makes children ready for the world of work and enables them to stay in it for the rest of their life. This model is not suitable for the world that has been described.

> Education must cease to be largely confined to the schoolroom and must once again emerge from it and be integrated with life.

Marshall McLuhan made the point a number of years ago. He tells of the two kindergarten kids walking down the street and identifying planes as they fly overhead. When they come to the schoolroom door, one of them turns to the other and says: "Let's go in and string those darn beads." What has to be asked is how much of the present educational system consists of stringing "darn beads."

Many schools are reality poor as compared to the outside environment and television. People all too often endure school because they must. In the central cities, schools are frequently the highest crime areas and sending our children to them is equivalent to indoctrinating them into a criminal life style.

> Apart from a relatively limited core set of needs, different people need to be able to benefit from different educational experiences if they are to be able to develop their strengths and minimize their weaknesses. The fundamental problem with much competency-based education today is that it tends to assume that all skills need to be achieved by all students. The result of this situation may be to force children to learn subject areas where they may never be competent rather than permitting them to develop their understandings and skills in those areas where they might become exceptional thinkers.

There is an assumption built deep into our educational system that the average student wants to do as little work as possible. If this is true, it follows that the only way that the educational system can be successful is to force learning on students. There is considerable evidence that this viewpoint is incorrect. First, it is known that students who are effectively challenged by teachers tend to do very well in their studies. Second, there is evidence that students who are given a chance to state their needs are very often highly aware of them.

The psychology of the present educational system has deep roots in the Puritan ethic. That old psychology needs to be examined in the light of the new psychological learnings which show that the people are capable of rising to challenges when they are given an opportunity to do so.

> There is a need for more effective community control of the educational system. This rhetoric is used frequently but the harsh reality is that the average local school board does not have enough up-to-date information to be able to make good decisions.

If the rhetoric of local control is to become real, two steps must be taken. First, the access of the interested local school board to imaginative and creative thinkers in the field of education must be improved. Second, ways must be found in which people in the community more effectively can communicate their feelings about appropriate styles of education to the teaching and administrative staff of the local educational bodies.

New Access Points

The most relevant and accessible sources of information in today's world are people who have been through an experience and can inform others of what they have done. Recognition of this reality, coupled with the computer and microelectronics revolution, will force changes in the methods of collecting, organizing, and disseminating information. There needs to be developed a real time, on-line process of accessing most forms of information. The process of developing such information bases will be achieved through cooperative behavior in which groups of people will work together without demanding individual credit for their efforts. What might be done now is suggested below.

The _prime movers_ need to be discovered at all levels of the society--those people who are aware that the future is created on the basis of self-fulfilling and self-denying prophecy and are prepared to act to change the _images_ that people hold of the past, present, and future. These prime movers would both be available for consultation in what has been called a "living library of competent individuals" and would assume the responsibility of trying to encourage their community to engage in activities which help to change the community, the state, and the region in directions which seem favorable.

It has long been known that much of the work in any system is done through invisible networks, rather than through the visible, formal authority systems. This is true both for organizations and within communities. Both need to be identified for organizations and within communities. The people need to be identified who cause informal networks to operate, not only within the educational system but also within local communities, states, regions, and the total country.

Most people would agree that exciting activities could develop if it were possible to identify the prime movers in various systems, interlink them with others who work in this informal way, and thus increase the scope of change. Many past dissemination efforts have failed because they have tried to create new channels for moving information rather than taking advantage of existing interest groups who share the concerns of those trying to move the information. The process used here can tie into existing patterns. Information about Action Linkage, which is one of the ways in which efforts are being made to put people in contact with each other, can be obtained from Box 2240, Wickenburg, Arizona, 85358.

The Role of Diversity

During the industrial era a major effort was made to create a melting pot. There was a felt need to turn everyone into Americans by getting rid of their cultural roots because it was believed that only when people saw themselves as Americans could the nation have the unity that it needed.

During the seventies, it was discovered that the melting pot never really melted--that ethnic concerns and race patterns persisted to a far greater extent than had even been realized in the past. There have been mixed reactions to this realization.

Fortunately, there is an increased awareness that fundamental diversity is a strength rather than a weakness. There is no objective truth, the more points of view that can be brought to bear on an issue, the greater the chance of seeing the overall reality. Instead of acting like the blind men who touched an elephant and insisted that the part they were touching was the whole, *it is necessary to work together* to sort out complex realities and be able to interrelate with them more effectively than has been done in the past.

In this context, the discussion about the relationship between the various cultures needs to be totally restructured. The differences between everyone are potential sources of strength rather than weakness. Similarly, the various languages spoken provide different windows on the world that can be used to deepen understanding of this incredibly complex world in which we live.

The primary difference between the industrial era and the communications era is between the competitive models of the industrial era and the cooperation of the communications era. Everyone is needed, with all their differences.

In the communications era, the person most valued is the one who is able to stretch to work with people who have profoundly different visions. Hopefully our interaction will be a small step toward enabling us to see in cooperative rather than competitive ways.

It is my good fortune to be tied to a number of activities which are now going on to re-examine how education should be structured to prepare people for the 21st century: we should never forget that the child born in 1983 will graduate from high school after the year 2000. Let us hope that the traditions from which we come can mutually enrich the future we want.

I never did care for the melting pot image. It suggested to me a dirty gray color as all the tints from the various cultures were mixed together in a least common denominator. How much brighter the future would be if we could learn to think about a cloth in which the various cultures were varied colored threads contributing to a brilliant pattern.

THE FUTURE OF GLOBAL SOCIETY

Don Glines

The leaders of the first half of the 21st Century are now in school. Potentially within reach of the newborn is 2100 A.D., and a view of the 22nd Century. The transition of society from the last quarter of the 20th Century to the next one hundred years and beyond has been of increasing concern. Humans have never before been blessed with as many resources at their disposal, but for all the economic wealth, educated people, sophisticated technology, and scientific knowledge, the future is not being addressed very effectively.

Social and economic costs of tapping into the finiteness of world resources, the pressures for redistribution of income and wealth, and the diminishing role of force as an instrument for effecting change are factors which are transforming global conditions. Serious doubts have been raised as to whether nations, institutions, and individuals can make major societal transitions without world catastrophies.

Humans have always faced disaster due to both natural circumstances beyond control (earthquakes) and those self-made (wars). However, now global survival may depend upon the ability of society to undergo major transformation in a limited period of time. This transformation involves individual perceptions, cognitive capabilities, and political processes. The basic change between times today and the problems of yesterday is that the principal hazards that humans now face

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are largely of their own making and largely within their control.

Futurists indicate that the world must eliminate ancient quarrels, create global partnerships, reduce the arms race, care for the human environment, and curb the population explosion before these factors are beyond control. Failure to achieve all of these could create a situation in which survival would be uncertain.

Many students of the future claim that now is an extraordinary moment in time--a period greater than the Copernician Revolution and the Reformation. The final result will be more profound than when humans shifted from hunting and gathering to an agricultural society, and later to an industrial society. There have been similar transitions in history but the failure now to handle the crisis could destroy the earth through quick nuclear/biological holocaust or slow cultural degradation. The pace of change is so great that a complete transition is essential within the current generation.

The world appears to be in an historically critical state. Great problems have been created for the universe in many respects. Survival may depend upon learning to live in a very different way. The pollution of resources is an illustration, yet what more critical societal needs are there than air, water, food and the total preservation of the biosphere.

The coming generations continue to face encounters with famine, war, and life-threats to the capacity of the globe. The long-term solution may require the abandonment of lethal techniques, the competitive ways of life and the current mentality of the industrial civilization. The near term outlook is for change forced by catastrophic external events rather than by preferable choice. Meeting challenges of the future may be at the payment of an extremely high price.

The world may be headed for the most fateful period in history. Industrialized society may be on the verge of a more wrenching period of change than any previous period, as a result of the rapidity, extensiveness and depth to which the cultural bases will be affected. Inflation and unemployment, energy and environment conflicts, world poverty, alienation and the emergence of different values are all indications that society is becoming unworkable.

In spite of the problems, there are a number of very positive signs ahead. The next century may see the solution to the eternal problems of human poverty, pollution, resource depletion, food and energy shortages, technological excesses, gaps between rich and poor nations and the deterioration of the quality of life. Though expanding production can absorb only a limited number of the exploding population, the optimists believe that there will be sufficient growth in the occupations within service and knowledge-based industries to provide work for all. Technology can bring social problems under control. Societal changes can occur without causing major disruption. Humans still have choice.

Regardless of viewpoint, critical decisions must be made in the very near future. The concepts of school in and basic education are being challenged by life support realities.

Potential nuclear annihilation is but one of the 64 or more dilemmas facing humankind. A holocaust involving multiple explosions would assail individual life, human society, and the total environment of planet Earth. Yet, according to a segment of futurist thinking, society seems to continue to deny the existence of such threats; people appear to be preparing for self-destruction. They do not yet seem willing to accept the possibility of nuclear extinction.

A real revolution in thought and action is needed if humans are to avoid nuclear war. Utopian thinking is an essential quantum leap. Massive use of these weapons of extermination would lead to the probable extinction of the majority of humankind. The fate of the earth does appear to lie in the balance.

School test score controversies seem pale in comparison to priority global curriculum concerns. Fortunately, there are active groups of people who are countering the nuclear buildup. There appears to be no way to prepare for nuclear war or survive an all out attack; the only possibility is to prevent it.

In many ways more menacing than megaton bombs is the frightening and growing have/have not gap between the affluent and nonaffluent people and nations. The gap must be reversed and narrowed. The question of whether to assist the starving individuals of the world has forced humans to the brink of another very difficult and decisive societal perspective, again causing people to address the very basic questions of human survival.

People may not continue to exist on the planet unless more care is given to the vulnerable reserves of air, water, and soil. The world society cannot be maintained forever if half the people are fortunate and half miserable; half free, half slaves; half confident, half in despair. Certainly school curriculum design needs to go beyond good writing skills.

The ecological conditions of the planet add to the concern, what must be realized is that the continued destruction of the life support systems could lead to social chaos and human disaster. The polluted rivers and seas, rapidly becoming the sewers of the world, threaten all humans. The oceans are a key to life support. The long years trying to reach agreement at the Law of the Sea conferences illustrate the continuing struggle between and among the giant private world corporations, the powerful developed ocean countries, and the poverty stricken, landlocked, Third World political entities. Why was it so difficult to find solutions for sharing with all humankind the fantastic life supporting potentials of the oceans?

The ocean mineral wealth is great from the nodules of manganese and from the deposits of such valuable assets as iron, nickel, copper and cobalt. There is additional oil to be produced. Energy sources are there to be developed through ocean thermal energy conversion. More accurate long-range weather forecasts are possible through charting changes in temperature at great depth. The military aspects, to enhance peace or have an advantage in war, are a further concern. Living beneath the sea is becoming more of a normal possibility through new undersea habitat developments.

However, if the oceans should die, it could signal an end to most life on earth--marine, animals, plants and humans. There is no way people can survive without the oxygen and other benefits from the water surfaces. Enormous climate changes, melting of the polar caps, stench, decay, flight to the highlands and cesspools which cease absorbing CO_2 could result from marine destruction.

It is estimated that at least half the population of the world, over two billion people, only have access to unsafe water. Ecologists are now writing that a poisoned river is any river that flows. The coral reefs of the world are being destroyed by human greed looking for souvenirs and trinkets. The whales and dolphins are being slaughtered for tragic short-term personal profits. The seals are rapidly being killed; only one-fourth of the seal population of the world remains. The sea otters are being eliminated; the valuable and essential ocean kelp is being destroyed. The bounty of the sea provided by nature is being reduced; the annual tonnage has been decreasing since 1971. As a result of the world population increase, the per capita fish catch is declining, while prices rise.

Considering population, resources, and environmental conditions from a long range, global perspective, the assessment of the world in the year 2000 is basically pessimistic. It could be fantastically optimistic, if there is a major shift in values, priorities and lifestyles.

National and international security is as endangered by the probable severe degradations of the ecological systems, as it is by threats of war. It is anticipated that rising world populations--particularly in lesser developed countries--will be a major cause of the problems facing the world at the turn of the century. Ninety percent of the new population will inhabit underdeveloped countries whose economies and land can least afford to support them. Perhaps more dramatic is that 80 percent of the people of the globe will be living in underdeveloped nations, many of these being crammed into overcrowded urban areas. Building to house these people will reduce fertile soils; the remaining land base will be further denuded of vegetation, stripped of organic matter and exposed to negative elements of nature. One-third of the world's agricultural lands may become deserts by the year 2000, a result of human mismanagement often caused by pressure from increased population.

There are numerous other concerns related to life support systems. Insect varieties have become immune to chemicals, leading to the possibility of swarms of insects becoming commonplace. Forests covered one-fourth of the world in 1960, but by the year 2000 may cover only one-sixth. Prices and scarcity may put fuel wood and charcoal out of reach. Shortages of fresh water can be expected to appear with increasing frequency and severity. The capacity of oil producing nations to provide a surplus should disappear, leading to skyrocketing oil prices.

These problems have an interdependent effect on the future. Depleted supplies of food, water and reproductive farmland in the lesser-developed countries, brought about by overpopulation, may create a sharp division between the affluent and those who have little or nothing. The deprived areas of the globe could become breeding grounds for revolutions and wars against wealthy nations.

The growing world population is threatening the survival of thousands of plant and animal species. By the end of the 20th century, some researchers believe over 1,000,000 species may become extinct. Many can be saved, if effective action is taken to halt the rapid deterioration of the natural environment. Over 1,000 birds and mammals are now in jeopardy. Perhaps even more serious is the anticipated potential extinction of 20,000 to 30,000 plant varieties. The rain forests may be extinct before the year 2000. Ironically, the problems are most acute in the poverty areas of the Third World countries, where people are clutching at everything in an effort to survive.

The future shape of the biosphere will depend in good measure on the political and economic policies affecting employment, land tenure, income distribution and population growth. The implications for concerned educators are staggering. The overhauling of the curriculum alone is monumental but tied to the struggle over values and what constitutes basic competencies present immense political problems. More important, though, is searching for commitment to determine how education can enhance the emergence of people who will take action now at their student level on a small, individualized scale and who later, as group leaders, will work toward judgments which may avert disaster.

Many of the problems appear solvable, sometimes through technology, more often through the plentiful resource of human labor, utilized in a humane way. The key is to overcome the seemingly insurmountable institutional and political barriers. The solutions may rest with the resettlement of humans, significant changes in lifestyles, substantial redirection of corporate policies and a high degree of cooperation among nations.

Ecological stresses can quickly become economic stresses. The effort to develop new crop land has led to an overall fall in the per acre yield. Returns on the heavy use of fertilizer are declining. However, crop production is in better shape than the fisheries, forests and grasslands. The new finds in oil are faced with the problem of overall diminishing returns, as are the developments in the mining industries and the limits of the capacity of the earth to absorb waste. The increasing prices of such items as oil, commodities, soybeans, lumber and paper add to the dilemmas.

Land and housing illustrate the conditions. Housing is becoming more unattainable; homes are purchased by what the person can afford to pay per month. Severe inflation rewards speculators and penalizes savers. The squalor found among the countless millions living on the streets and in shanty towns in such cities as Calcutta, Hong Kong, Mexico City, Rio de Janeiro and Lima intensifies the problems. Vast sums are now being spent on pollution control.

Yet greed continues to threaten life support. The twelve countries developing the future of Antarctica, with its tremendous potential to help save the world--its essential life balances, its oil and gas resources, potential coal and minerals, fish, seals, and icebergs for possible fresh water supplies--are continuing to look at the antarctic resources as another continent to exploit. The vulnerability of the world is exposed but most people refuse to heed the message. Exploitation for profit remains the prime concern of the industrial nations currently controlling the freezing water mass.

The impact of these messages for teachers, working day by day with their students, provides an exceptional opportunity to help preserve the global ecological equilibrium. Students, as people, need the courage to help defer resource exploitation until the real priorities of society can be assessed.

The factors leading to a new society, and to the elimination of current schooling approaches, should be further examined. Educational leaders can make a significant difference. They have an obligation to help the people of the world in general and those in their local communities in particular to chart a new course toward a preferable and sustainable society.

NEW AGE ETHICS

ETHICAL IMPLICATIONS ON CRITICAL FUTURE ISSUES

Patricia W. Anderson

The future: We arrive today, in 1983, as a species still intact, still viable--at the threshold of a new age. Some would say that Einstein's discovery of the formula for the conversion of mass into energy, $E=mc^2$ marked the beginning of the New Era. Others claim different milestones: the discovery of DNA, the chemical code of life, the invention of the transistor (which ushered in the microelectronic revolution), the discovery of gene cloning in microscopic bacterial factories or the birth of the first "test tube" baby. The criteria for demarcating the New Age might differ but few would argue that it has arrived.

Our purpose is to explore the ethical implications of this New Age. Do New Age Ethics differ from the ethics of a former era? If so, how? What specific technologies suggest the more profound ethical dilemmas? Are we coping as a nation with the ethical issues of the future?

At the outset it is important to make one preliminary comment. Ethics and interrelated discussions can easily become mired in politics, hyperbole, subjective philosophical bias and moral pronouncement. These remarks are intended to serve as a catalyst and for study and deliberation.

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THEOREM: There exists a New Age Ethics, qualitatively different from the ethics of a former era.

Several major categories come to mind in considering ethical issues: medical intervention, genetic engineering, and biotechnology, modern armaments (including chemical and biological warfare), nuclear energy, biocybernetics and computerization. In support of this theorem, several propositions which directly relate to the major categories cited above and to the ethical issues they evoke will be suggested.

As a preliminary to this set of propositions, it might be helpful to consider a basic definition of ethics.[1] Traditionally, ethics has concerned the immediate ends and direct interaction between persons, and the moral principles and values relating to human conduct. In the New Age or scientific-technological society, the nature of human action has been profoundly and irrevocably modified. Knowledge and technology have augmented human's ability to affect other human beings, other species, ecosystems and the planet. The old, anthropocentric ethics is suddenly inadequate in defining human's ethical constructs. An ethics for the New Age must take into account humankind's new relationship not only with respect to human interaction but with the natural world, the machine, the web of life and the ecosphere itself.

PROPOSITION: Humankind occupies a critical link within the chain of life. Human's self-interest as a species is inseparable from the well-being of the earth.

This connectedness of the human species within the web of life is articulated with elegance and precision by Lewis Thomas in his classic work, The Lives of a Cell (1974). Dr. Thomas draws the analogy between planet Earth and a single cell, examining in turn the interdependent communities and mutual support systems within the life chain. From microbes and multicelled organisms to societies as organisms, Thomas examines the earth as a living cell whose fragile membrane--the atmosphere--shields against the potentially lethal ultraviolet radiation from the sun, nurtures great varieties of life and diffuses the impact of the millions of meteorites which fall against the earth each day. In meticulous detail, Thomas profiles the elaborate collaboration in nature and warns that humans are "safe, well ventilated, and incubated, provided we can avoid [certain] technologies" (p. 173).

One need not look far to see evidence of the connectedness among life species and the extreme vulnerability of the life chain to the technology of the Scientific Age. Accounts of industrial pollutants (including invisible toxic gases), poisonous chemical and nuclear waste, acid rain, and potential depletion of the ozonosphere by supersonic transports and nuclear weapons suggest the ecological peril which we face both as a species and as stewards of the planet. By current estimates, the earth loses species at the rate of about three per day.

Several examples document the magnitude of the threat to ecosystems. Cubatao, Brazil's richest city and South America's largest industrial park, is said to be the Valley of Death. The last complete study, made five years ago, revealed that on any given day the 22 giant petrochemical and steel plants in this city of 85,000 pump into the air 875 tons of toxic gases, 473 tons of carbon monoxide, and 182 tons of sulfuric oxide. Four rivers that run through the city are dead, and trees and soil are lifeless. There is a high incidence of birth defects among the human population; a recent study showed that 65 of every 1000 children born in Cubatao die of anencephalia, a condition in which children are born with only vestiges of the brain--not including the parts that allow thought and consciousness (Freed, 1983b).

Related news accounts from Brazil describe disruption in the ecosystem of the Pantanal (Portuguese for swamp), a wilderness paradise of wildlife and flora which extends over 80,000 square miles. The poaching of alligators to satisfy fashion's craze for reptile skin handbags and shoes has led to mass slaughter of the alligator. Within the past four years, 20% of the 20 million alligators of the swamp have been killed, which in turn has disrupted the natural balance between the jacare (alligator) and the piranha. Without the control of the piranha population by the alligator, the piranha have driven out other fish and have become a serious threat to ranches (it takes a swarm of piranha 20 minutes to strip a 650 pound steer) (Freed, 1983a).

Other examples of ecologic peril abound. The elimination of tropical rain forests in West Africa, southern Asia, and the

Caribbean has been documented (see for example, National Geographic, January, 1983), and rain- and snow-borne sulfuric and nitric acids (so-called acid rain) from fossil fuel combustion have deadened thousands of lakes in Scandinavia and hundreds in the U. S. and Canada (LaBastille, 1981). Sterile and fishless, the lakes show the heavy toll paid for industrialization.

Acid-rain, toxic-chemical pollution, and carbon dioxide build-up are ranked by some scientists as among the worst "environmental time bombs" (LaBastille, 1981), threatening ecosystems with disruption and death and linking generations over time. Several incidents in the United States in the past few years bear testimony to the threat: Love Canal, where toxic chemicals such as benzene seeped into the basements of houses along an abandoned dump site; Times Beach, Missouri, where the spraying of dirt roads with dioxin-laced oil in the 1970s resulted in bizarre deaths of animals and led to dangerously high levels of dioxin in many of the town's drainage ditches today ("The Dioxin Scare," 1983); and Three Mile Island, the site of a nuclear accident four years ago at Harrisburg, Pennsylvania, where the overheated uranium core came within 30 to 60 minutes of a meltdown (Pollard, 1983). Three Mile Island raises the specter, too, of the disposal of nuclear waste--radioactive garbage--with its residual radioactive potency threatening human beings hundreds of years from now (Carlson, 1983).

At issue is the very habitability of the earth and the prospective habitability of the earth, which introduces a second proposition.

PROPOSITION: There is a new transgenerational ethics, dimensioned in time.

Jonathan Schell develops the rationale for this transgenerational ethics in his landmark work, The Fate of the Earth (1982). He cites (p. 118) Hannah Arendt's distinction between the private realm and the common world, quoting Arendt's (1958) description of the latter:

> The common world is what we enter when we are born and what we leave when we die. It transcends our life-span into past and future alike; it was there before we came and will outlast our brief sojourn in it. It is what we have in common not only with those who live with us, but also with those who were here before and with those who will come after us.

The critical links which bind today's generation with the dead and the unborn are starkly illuminated by the sense of our responsibility for the condition and habitability of the earth. The present generation was once the future generation, and was received by the then-stewards of the earth. In turn, this generation is charged with the well being of the earth and must allow for the unborn, with each one assuming responsibility for preserving life on earth for future generations.

Related to a transgenerational ethics is a third proposition.

PROPOSITION: Temporal parameters have been redefined. There is a new meaning in the link between the past, the present and the future.

The redefinition of time is substantiated by several phenomena. For the first time in the history of humankind, given nuclear armaments and the peril of a holocaust, one cannot assume the future; one must achieve the future (Schell, 1982). Second, medical technologies have blurred the boundaries between life and death, present and future, by artificial life-support systems for the individual, raising the ethical question of when, and on whose say, it is right to withdraw medical treatment. A recent dramatic example of new boundaries between life and death involved the fetus which grew in a dead woman's womb for 63 days while the mother's body was maintained on an artificial support system (Nelson, 1983).

Another indicator of a redefinition of temporal parameters is the acceleration in technological development, eclipsing former rates. Knowledge is said to be doubling every five years, and science fiction of 1970 ("test tube" babies, for example) has, in many instances, become a commonplace occurrence today. Time has taken on a new significance, too, when one considers the swiftness with which humans can now "self-destruct" as a species in a nuclear holocaust, after a few million years residency on earth.

A critical dimension in the redefinition of time has come about by two identifiable phenomena: participatory evolution and the change in change itself (Ferguson, 1980), from which we derive the following two propositions.

PROPOSITION: Humans are engaged in Participatory Evolution.

PROPOSITION: Humankind is witnessing the change in change itself.

Participatory evolution has developed as a result of advances on two fronts: genetic engineering (biotechnology) and biocybernetics. With the discovery of DNA, the chemical code and blueprint for life, the site of evolutionary forces moved from the genes to the cerebral cortex (Schell, 1982); the laws of natural selection under Darwinism were superseded by man-made selection. As Marilyn Ferguson commented in her 1980 publication The Aquarian Conspiracy: "For the first time in history, humankind has come upon the control panel of change--an understanding of how transformation occurs. We are living in the change of change" (p. 29).

The change in change itself is indexed in some measure by placing the genetic revolution in evolutionary context. While life appeared on the earth 4 billion years ago, and man appeared 1 million years ago, genetic engineering was nonexistent 20 years ago. With the discovery of the structure and functions of DNA (deoxyribonucleic acid) and DNA cloning techniques, scientists achieved the means for diagnosis and clinical treatment of some inherited diseases, the tailoring and transplantation of genes from one species to another, and the promise of gene therapy (the process of correcting genetic diseases by replacing defective genes with normal ones or by chemically mending defective genes) ("Entering the Golden Age," 1982). Scientists, according to one science journalist, foresaw the reality of "genetic surgery" in the early 1970s:

> (G)eneticists will be able to delete undesirable genes, insert others, and mechanically or chemically transform still others, foreordaining, at the molecular level, the physical, mental, and even racial

> characteristics of the incipient individual. (Rorvik, 1970, p. 19).

Today, fetal and newborn screening for certain genetic disorders is already common. Scientists are refining their understanding of the manner in which cells develop, differentiate and die. Researchers are utilizing recombinant-DNA technology in the search for those arrangements of the genes which give optimal selective advantage, as in the case of the "2x" mouse.[2] For the general public, such experimentation often recalls eugenic efforts of the Nazis to "purify" a race, or fears of human-animal chimeras and humanoid hybrids.

David Rorvik in his 1978 bestseller, In His Image. The Cloning of a Man, explores the scientific, social, moral, and religious issues of cloning. He raises many ethical issues of concern: the bioethicist's concern for when life begins and the sacrificing of "bench embryos" (zygotes or fertilized cells) during experimental procedures; the possibility of ectogenesis (complete test-tube pregnancies in which babies would essentially be decanted from bottles); the freezing of embryos and their subsequent implantation at a later time in surrogate mothers; cloning as a contrived perpetuation into another generation of an already existing genotype (for example, to replicate individuals of great talent or other attributes, to bypass the risk of genetic disease, to provide large sets of genetically identical humans for studies of nature versus nurture, to produce sets of identical persons to perform certain occupations, or to produce embryonic replicas of each person, to be frozen away until needed as a source of organ transplants); legal issues with respect to clinical offspring; and prefabricated, "marketable" babies. Rorvik notes that in 3 billion years more than 100 million species have existed on the earth, all but 2 million of these species are now extinct. Previously, it took 5 to 20 million years for a single mutation to become completely incorporated into species; modern technology permits new radical mutational changes in the genetic schemata of any given species practically overnight (1978, p. 154).

Developments in biocybernetics have led to the ability to link human beings directly with the machine to extend and amplify human strengths and to provide for versatility and reversibility in evolutionary adaptation (Rorvik, 1970, p. 21). David Rorvik in his provocative publication entitled As Man Becomes Machine (1970) argues against establishing a gene/machine dichotomy in conceptualizing futuristic evolutionary patterns.

> The true cyborg is a combination of the two, and in some cases genetic engineering might be necessary before man can be satisfactorily wed to machine. It might be used, for example to encourage the body to accept readily the implantation of foreign materials, of electronic circuitry, artificial organs and the like . . . [or] to alter body proportions so that the body can better accommodate mechanical additions. (p. 20).

The medical cyborg, or bionic is already a reality for thousands of individuals with steel bones, pacemakers, cardiac valve replacements, artificial arms and legs, plastic corneas, mechanical hip joints and implants. This medical cyborg, which Rorvik calls an "evolutionary chimera," heightens the plausibility of "total prosthesis" in man. This concept, the exchange of all bodily parts except the brain for more reliable ones, led Rorvik to recall the words of Thomas Edison: "The body is just something to carry the brain around in" (Edison, cited in Rorvik, 1970, p. 16). Recent success with the artificial heart and with the use of computerized artificial arms and legs for quadriplegics and paraplegics represent quantum leaps in biocybernetics, suggesting the future promise in this field.

Cyborg development suggests man-machine systems of other sorts: Cybernetic Anthropomorphous Machine Systems (CAMS) that will "project and amplify man's senses and manipulative capabilities to remote and hostile environments without endangering the man himself" (Rorvik, 1970, p. 161), a man-machine partnership which might prove to be critical in space and oceanic exploration;[3] Biofeedback Training (BFT), in which electrocardiograms, electroencephalographs, and other monitoring devices link physiological functions with an individual's consciousness and control; and electronic stimulation of the brain (ESB), in which direct electronic stimulation of certain cerebral sites (via electrodes which are surgically implanted in the brain) may evoke a full range of emotional and physical responses.

These technologies and prospective technologies raise a host of ethical dilemmas: personhood, civil rights, the quality of life, electroconvulsive therapy, the rights of mental patients, electronic surveillance, equity in access and benefits of medical care, genetic intervention and individual risks, proxy consent, euthanasia, and the allocation of resources at the national and global level. Cases involving such issues are coming before the courts with increasing frequency, and it can be reasonably assumed that their complexity will only be intensified in the decades ahead.

From the concept that the New Age Ethics is characterized as transgenerational, transpecies, and evolves in part from the human's relationship to high technology and to the Ecosphere, a sixth proposition can be derived.

PROPOSITION: Life is information. Death is a loss of information and a disruption in the transgenerational relays in information for both humans and nature (Schell, 1982).

To understand this proposition, it is helpful to focus upon four levels of life: the organism, the species, the ecosystem and the ecosphere. Schell (1982) argues that human mastery over nature has produced a categorical increase in the power of death on earth and the threat of a return to randomness within each level:

> An organism's ability to renew itself during its lifetime and to reproduce itself depends on the integrity of what biologists call "information" stored in its genes. What endures - what lives - in an organism is . . . a configuration of cells which is dictated by the genetic information. What survives in a species, correspondingly, is a larger configuration, which takes in all the individuals in the species. An ecosystem is a still larger configuration, in which a whole constellation of species forms a balanced, self-reproducing, slowly changing whole. The ecosphere of the earth - Dr. Lewis Thomas's "cell" - is, finally, the largest of the living configurations, and is a carefully regulated and balanced, self-perpetuating system in its own right. At each of these levels life is coherence, and the loss of coherence - the sudden slide toward disorder - is death (pp. 111-112).

While death for the individual is built into its plan, notes Schell, species and ecosystems are indefinitely self-renewing as long as environmental circumstances permit. Human intervention in the environment, when it results in a pace of death which is too great, threatens species, ecosystems and the ecosphere in its entirety.

Schell calls attacks on either the biological or cultural heritage that human beings transmit "crimes against the future." We are confronted with the moral obligation to ensure transgenerational relays in information for both humans and nature.

A summary of the six propositions discussed thus far is given below:

> Proposition: Humankind occupies a critical link within the chain of life. Human's self-interest as a species is inseparable from the well-being of the earth.
>
> Proposition: There is a new transgenerational ethics, dimensioned in time.
>
> Proposition: Temporal parameters have been redefined. There is new meaning in the link between the past, the present, and the future.
>
> Proposition: Humans are engaged in Participatory Evolution.
>
> Proposition: Humankind is witnessing the change in change itself.
>
> Proposition: Life is information. Death is a loss of information and a disruption in the transgenerational relays in information for both humans and nature.

The specific ethical issues which attend medical intervention, biotechnology, chemical and neutron armaments, nuclear energy, biocybernetics, and computerization of the New Age comprise a commanding list and fascinating case studies. Some of these issues are listed in Table I. Each is related in some manner to the set of propositions listed above. Each merits scrutiny and thoughtful consideration. Each compels examination of the possible bifurcation between science and technology on the one hand and humanitarian values and concerns on the other, and recognition of the philosophical, ethical and social implications of technology. This leads to a seventh proposition:

PROPOSITION: The classic two cultures between the scientist and technician on the one hand and the layperson on the other (C. P. Snow) are no longer viable. A new imperative exists to recognize the social implications of technology, and to guide the development and utilization of technology with humanitarian values.

These seven propositions suggest the parameters of the New Age Ethics. One cannot hope to address the essence of these ethics, however, unless one also confronts the overriding ethical issue of today: the nuclear predicament. This issue takes precedence over and eclipses all other moral questions. It is this issue that will now be examined.

To Be Survived: The Ethical Imperative of the Future

When humankind learned to convert mass to energy through atomic fission, the means of unleashing cosmic energy within the earth's frail ecosphere was discovered. The amount of mass expended in Hiroshima on the morning of August 6, 1945 was 1 gram, or 1/30th of an ounce, yet the city was reduced to rubble instantaneously with the detonation of the bomb. Today,

TABLE I. Ethics of the New Age, by Level of Life

Individual/Organism

Personhood
Civil rights
Informed consent
The right to health care
Death with dignity
Proxy consent (for the child, etc.)
Privacy/confidentiality
As subjects in research
Treatment of terminally ill
Bench embryos
Zygotes (fertilized eggs) and their use in experimentation
Contract pregnancies and paternity issues
Withholding of medical treatment: when & how
Euthanasia: active & passive

The quality of life issue
Genetic engineering
Cloning
Surrogate motherhood
Fetal research
Electroconvulsive therapy
Drug therapy
Rights of mental patients
Licensing for reproduction
Abortion
Fetal development in dead organism being artificially maintained
Biocybernetics
Genetic monitoring, the testing for jobs
In vitro fertilization and anonymity of donor/recipient
Capital punishment

Paternity of ideas
Equity in access and benefits of medical care
Physical security and freedom from fear with respect to bodily and psychic harm
Randomization in medical experimentation and problem of informed consent
Electronic surveillance
Electronic stimulation of brain (ESB)
Ectogenesis
Genetic intervention and individual risks
Living wills
Tests of competency (autonomy of person)

Species

Eugenics (positive)
Eugenics (negative)
Life cycle: maintenance
Civil rights as a species

Natural selection vs. human manipulation
Toxic pesticides, acid rain, industrial pollution
Quality of life
Self-determination

Chemical armaments
Biological armaments
Nuclear armaments
Maintenance of culture

Ecosystems

Maintenance of diverse ecosystems
Mutual support systems

Maintenance of balance in chain of life
Disposal of nuclear wastes

Maintenance of diversity of species

Ecosphere

Preservation of habitability of Earth

roughly 50,000 nuclear warheads are in place around the globe. These warheads have the explosive yield of 20 billion tons of TNT, an amount which is about 1,600,000 times the yield of the bomb which exploded over Hiroshima (Schell, 1982). A nuclear holocaust, "unthinkable but never doable," is a possible--and probable--reality of this Atomic Age, placing each member of our species and life on earth in jeopardy of extinction. In the face of this peril, one can only recoil in fear, helplessness, despair, and denial, succumbing to a political, emotional and intellectual paralysis without precedent in human history.

An epistemology of the effects of nuclear weapons can be found in several sources,[4] and familiarization with these effects can only lead one to question the justification for maintaining and expanding current nuclear arsenals on earth. Rather than documenting the technical capabilities of nuclear weapons here, however, what should be explored is the question of how we have become so deeply embedded in the nuclear predicament and a few suggestions for freeing ourselves from the entrapment.

As noted by Schell (1982), one of the basic characteristics of the nuclear predicament is the monstrous disproportion between the "basic power of the universe" and the merely terrestrial creatures by which and against which it is aimed. The dimensions of this predicament are revealed by several tenets, enumerated by Schell:

1) Present levels of global armaments are great enough to possibly extinguish the human species

> if a holocaust should occur, 2) in extinction, every human purpose would be lost, 3) there are no "second chances" once human extinction has occurred, 4) the possibility of a nuclear holocaust must be dealt with morally and politically as though it were a certainty, and 5) either by accident or design, a holocaust can occur at any second. (Schell, 1982, pp. 218-219).

These tenets lead to two further propositions.

PROPOSITION: Humans cannot undiscover the knowledge of nuclear weaponry. Science has provided irrevocable knowledge but scientific progress cannot deliver humankind from its own findings and from "our own destructive and self-destructive nature" (Schell, 1982).

PROPOSITION: Human extinction threatens the cancellation of all future generations of human beings. Human's first death, in mortality, is now compounded by a second death, the death of humankind (Schell, 1982).

Philosophers and social critics have often commented upon the permanence of the scientific edifice. While social revolutions come and go, scientific revolutions are said to belong to all places and all times. By corollary, the annihilation of the world may occur only once:

> We are indeed fated by our acquisition of the knowledge of physics to live for the rest of time with the knowledge of how to destroy ourselves. But we are not for that reason fated to destroy ourselves. We can choose to live. (Schell, 1982, p. 219).

While death of the individual cuts off life, part of its meaning is in the fact that it occurs in a biological and social world that survives. Extinction, on the other hand, cuts off birth and offers no redemption.

Robert Jay Lifton, a Yale psychiatrist, has analyzed the effect of "nuclearism" on the psyche. Writing with Richard Falk in their Preface to the 1982 publication, Indefensible Weapons, they define nuclearism:

> By nuclearism we mean psychological, political, and military dependence on nuclear weapons, the embrace of the weapons as a solution to a wide variety of human dilemmas, most ironically that of 'security.'

Lifton names three trends in the nuclear weapons predicament which have led to the dominance of nuclearism in our lives: (1) the changed relationship between people and nuclear weapons, with no one person or group exercising the capability for control, (2) refinements in nuclear technology which have encouraged the perception of a nuclear warhead as merely another weapon rather than a step toward oblivion, and (3) the various factors contributing to the increased possibility of nuclear war (see Figure 1). He describes the nuclear entrapment in which a sense of bomb-induced futurelessness leads to the stockpiling of more and more weapons in an effort to regain security (Figure 2). The psychic numbing which sets in individually and collectively (Figure 3) evolves through fear and a sense of threat, perceived helplessness, resignation and cynicism, and detachment, to finally an attitude of waiting for the bomb.

This psychic numbing is in part a function of nuclear illusions. Lifton notes the illusions that nuclear weapons can be limited and controlled, that foreknowledge and psychological preparedness will help people cope in the event of a nuclear attack, that preparations such as evacuation plans and places for protection (shelters) in the event of an attack are viable, that recovery is possible and, finally, that nuclear warfare can somehow be a rational response to provocation (Lifton, in Lifton & Falk, 1982, pp. 14-21).

Figure 1. Trends in the nuclear weapons predicament (Reference: Lifton, in Lifton and Falk, *Indefensible Weapons*, 1982)

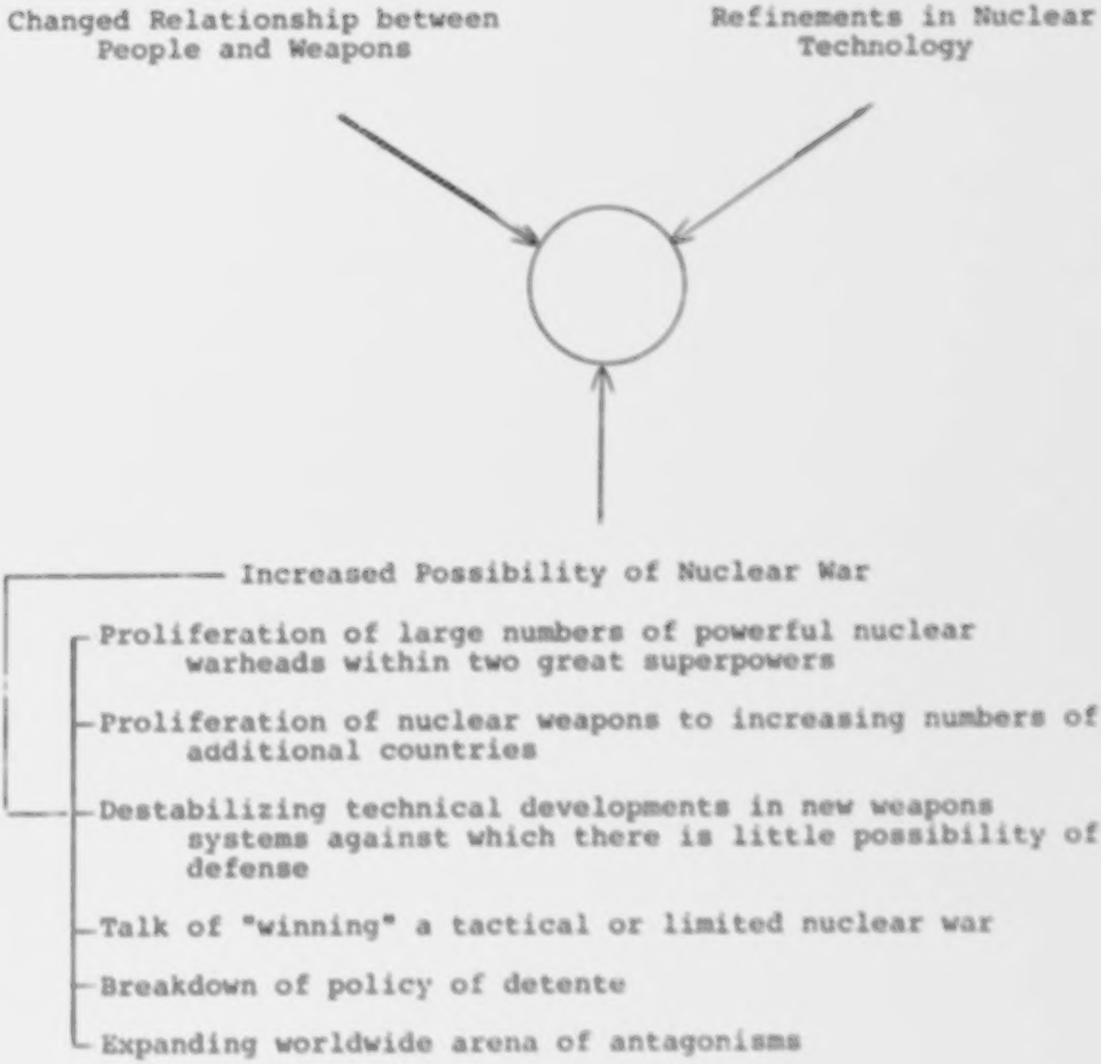

Changed Relationship between People and Weapons
Refinements in Nuclear Technology
Increased Possibility of Nuclear War
Proliferation of large numbers of powerful nuclear warheads within two great superpowers
Proliferation of nuclear weapons to increasing numbers of additional countries
Destabilizing technical developments in new weapons systems against which there is little possibility of defense
Talk of "winning" a tactical or limited nuclear war
Breakdown of policy of detente
Expanding worldwide arena of antagonisms

Figure 2. Nuclear Entrapment (Reference: Lifton, in Lifton & Falk, *Indefensible Weapons*, 1982)

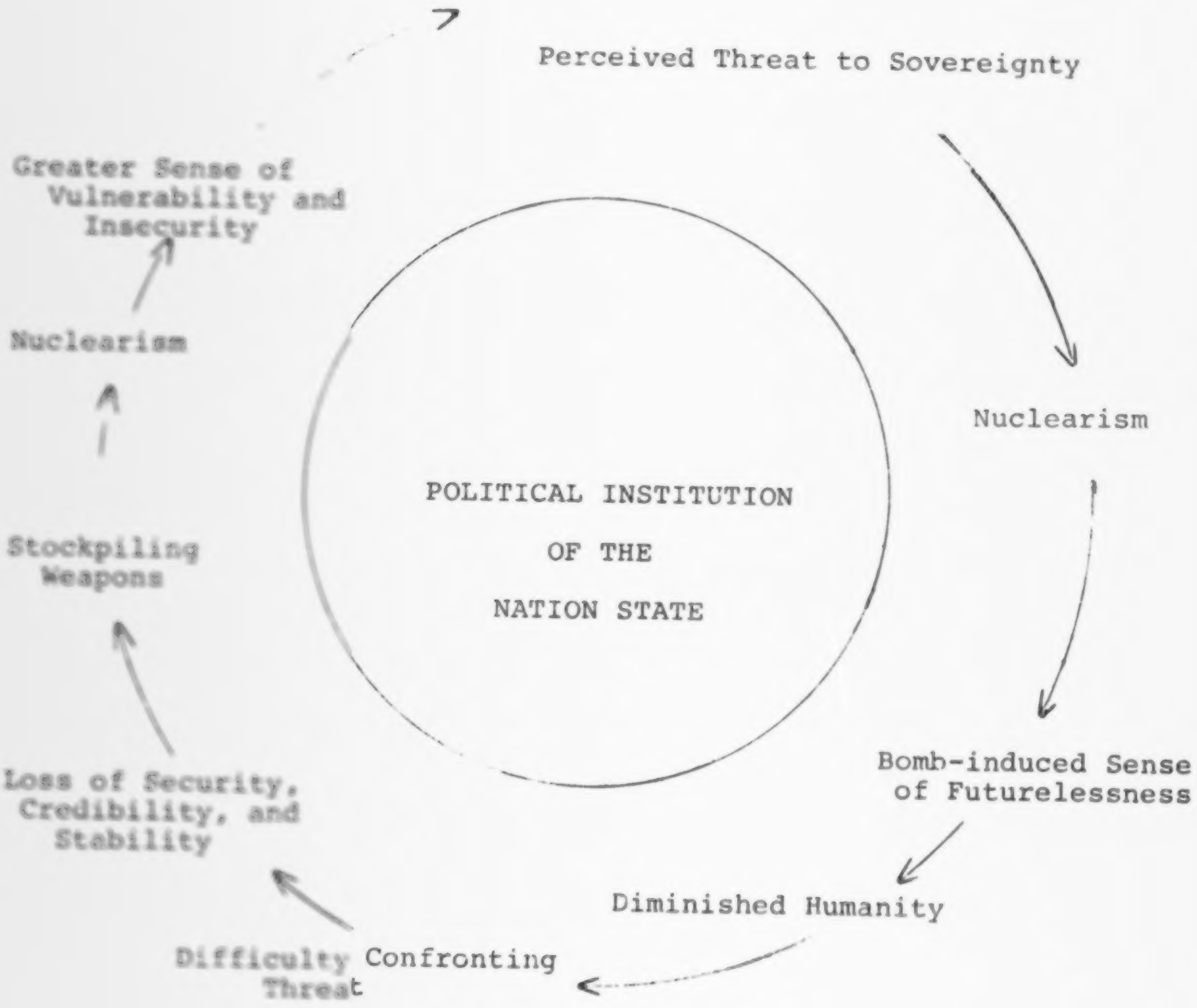
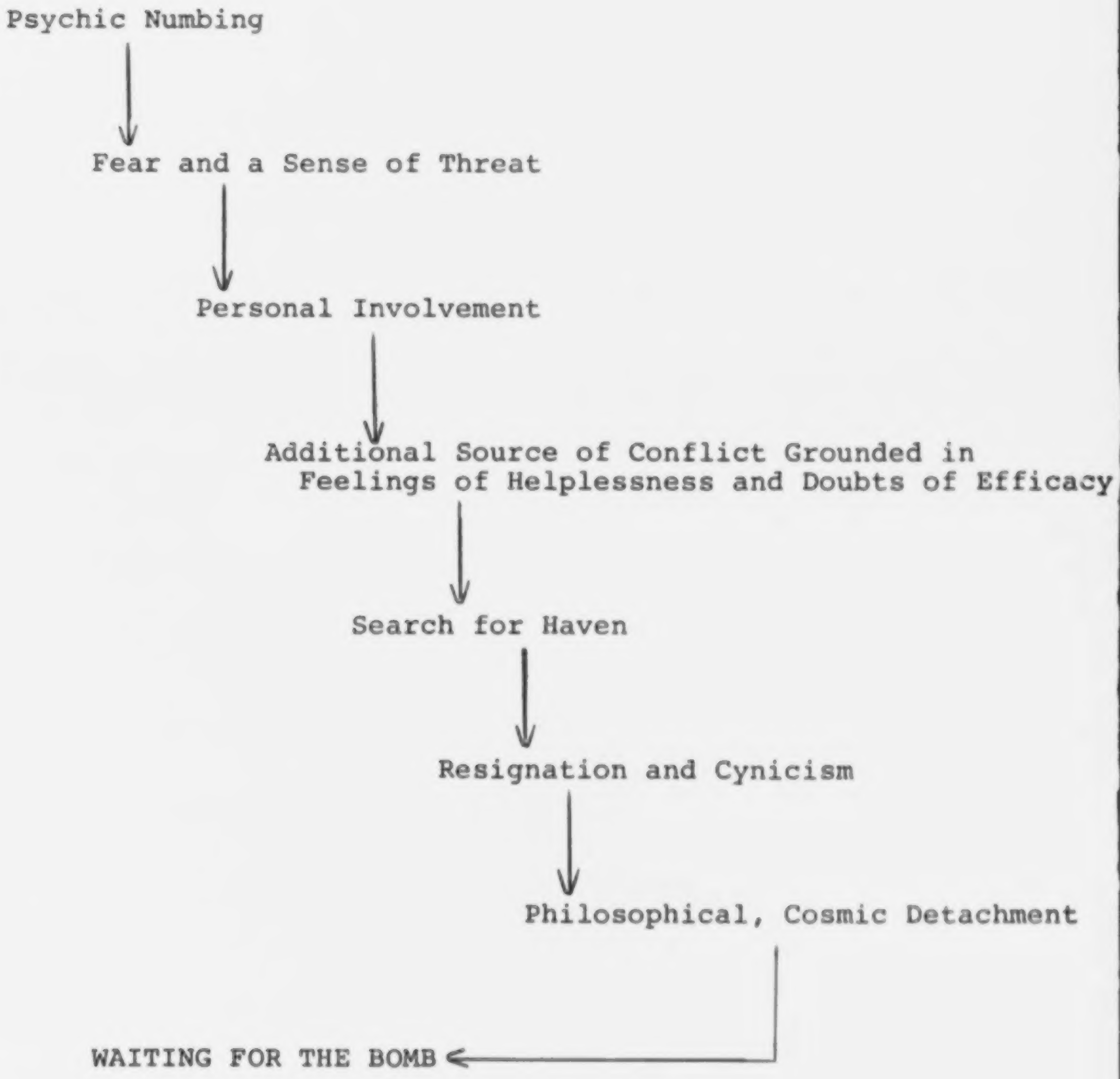

Perceived Threat to Sovereignty
Nuclearism
Bomb-induced Sense of Futurelessness
Diminished Humanity
Difficulty Confronting Threat
Loss of Security, Credibility, and Stability
Stockpiling Weapons
Nuclearism
Greater Sense of Vulnerability and Insecurity
POLITICAL INSTITUTION OF THE NATION STATE

Figure 3. Psychic Numbing (Reference: Robert Jay Lifton, in Lifton & Falk, *Indefensible Weapons*, 1982).


Psychic Numbing
Fear and a Sense of Threat
Personal Involvement
Additional Source of Conflict Grounded in Feelings of Helplessness and Doubts of Efficacy
Search for Haven
Resignation and Cynicism
Philosophical, Cosmic Detachment
WAITING FOR THE BOMB

Lifton sifts through these multiple illusions and counters them with three major Nuclear Age truths which were singularly conveyed by the bombings of Hiroshima and Nagasaki: the totality of destruction, the unending lethal influence of nuclear detonations and the fact that humans are the victims of an ultimate weapon, a force that threatens to exterminate our species. By examining the four stages in the psychological and social consequences of the bomb for survivors of Hiroshima (immersion in the sea of dead and near dead, invisible contamination, "A-bomb disease" and lifelong identification with the dead), Lifton underscores the sense of nuclear actuality - the sense that a nuclear holocaust in all its horror can actually occur.

The works of Lifton and Falk and by Schell, among others, point to the spurious normalcy or double life in which everyone is now caught. On the one hand, humankind stands at the threshold of self-extinction as a species and yet we are operating with a prenuclear mentality. Deadened, numbed to the nuclear peril, we conduct "life as usual." This concept leads to the eleventh among the propositions:

PROPOSITION: The psychological pressures of the Atomic Age have induced a collective numbing in society. Humankind stands at the threshold of self-extinction as a species, with a prenuclear mentality.

As Jonathan Schell so cogently expresses: "The question to be asked then is no longer what the features and characteristics of extinction are but what it says about us and what it does to us that we are preparing our own extermination" (Schell, 1982, p. 147).

Setting Back the Clock

Since 1947 the Bulletin of the Atomic Scientist has featured a "doomsday clock," with the hands of the clock placed farther away or closer to midnight in correlation with the editors' judgment of the world's proximity to a nuclear holocaust. Schell proposes a hypothetical companion clock whose hands, instead of metaphorically representing a judgment about the probability of a holocaust, represent the amount of time that people can be sure they have left before being destroyed in a holocaust. Schell argues that at the present time the hands would stand at, or a fraction of a second before, midnight (pp. 108-109).

In considering strategies for setting back the clock, the basic fact is that there will never be a time again when self-extinction is beyond our species. One cannot undiscover Einstein's formula $E=mc^2$. What can be done is to synchronize ideas and actions as well as political institutions to an Einsteinian world. One can confront the peril of extinction and the peril of the expiration of the planet. One can ask questions about current political arrangements, can question the hidden effect nuclearism is having in our lives and the lives of our children, can ask whether in the Nuclear Age, traditional goals of victory, national defense, and military superiority are obsolete (Schell, 1982), given that in a nuclear war a decision by arms is impossible.[5]

Educators are in a position to provide leadership in the New Age. Educators can promote a formed awareness (Lifton,

1982) as a first step toward reconstituting the relationship among generations, both present and unborn, across time and place, and the relationship between Humankind and the planet Earth. Humans can opt for survival as a species in symbiosis with the earth, in a new partnership between generations, and with new global linkages among peoples.

FOOTNOTES

1. The Random House Dictionary (Unabridged Version, 1967) defines ethics as 1) a system of moral principles; 2) the rules of conduct recognized in respect to a particular class of human actions or a particular group, culture, etc.; 3) the moral principles, as of an individual; and 4) that branch of philosophy dealing with values relating to human conduct, with respect to the rightness and wrongness of certain actions and to the goodness and badness of the motives and ends of such actions.

2. Bigger mousetraps and thorny ethical issues. The New York Times, December 19, 1982. The gene for growth hormone from a rat was transplanted into the fertilized egg cell of a mouse, resulting in six mice endowed with the foreign gene growing to an unusual size. The experiment aroused considerable interest with respect to the future potential of the transplantation technique in human beings.

3. CAM projects are based upon telefactoring, doing something at a distance. Rorvik cites the example of space repairs and exploration, in which telefactors would replace humans physically but not mentally in potentially hazardous situations.

4. See especially: Lifton and Falk, 1982. Schell, 1982. The medical consequences of nuclear war, 1983.

5. This point is made by Jonathan Schell, who argues that extinction has replaced war as the final arbiter of disputes among peoples.

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SOCIOECONOMIC CULTURAL PLURALISM:
ITS MEANING FOR THE FUTURE AND EDUCATION

Bob H. Suzuki

The past decade or so has seen the emergence of cultural pluralism as a significant concept in education. Its primary embodiment has been in the field commonly referred to as multicultural education, which has undergone rapid growth in the past 10 years. However, there have been many, widely-differing conceptualizations of multicultural education forwarded by its various proponents and, as a consequence, the field is currently so ill-defined that just about anything passes under the name of multicultural education. Moreover, many multicultural education programs are so narrowly conceived that they can address very few of the concerns voiced by this 15-year-old student:

> There is mass confusion in the minds of my generation in trying to find a solution for ourselves and the world around us. We see the world as a huge rumble as it swiftly goes by with wars, poverty, prejudice, and the lack of understanding among people and nations. Then we stop and think there must be a better way and we have to find it.

This state of affairs is quite unfortunate because there is a continuing and increasing need for multicultural education in the decades ahead. According to the 1980 U. S. Census, minorities comprised about 21 percent of the total population, or over 1 out of every 5 persons. Thus, minorities can no longer be considered a relatively insignificant proportion of the population. Furthermore, if one looks at the school-age

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population, minorities are probably closer to 30 percent of the population. What is even more significant is the rate at which the minority population is growing. From 1970 to 1980, the White population grew by less than 7 percent; whereas the minority population increased by about 30 percent--more than 4 times faster. At these rates of growth, by 1990 the minority population will comprise at least 25 percent of the total population, or 1 out of every 4 persons. In California, the most populous state of the union, it is projected that by 1987, minorities will comprise over one-half of the state's population.

Equally significant is that, while minorities currently constitute about one-fifth of our population, the proportions are almost exactly reversed in the population of the world as a whole. In fact, Whites comprise less than one-fourth of the world's population; whereas the overwhelming majority of the world is populated by people of color. Given the increasing interdependence between nations and the significant changes in the patterns of international trade it is clear that Americans will engage increasingly in interactions with people of different cultural backgrounds in both the domestic and international context.

Thus, if Americans are going to solve our major societal problems and also function effectively in the international arena, our schools must give increasing emphasis to the knowledge, skills, and values that are necessary to function effectively in various cross-cultural contexts. Furthermore, we must develop a conceptualization of multicultural education that will remain relevant to our rapidly changing society and be based on a broader concept than cultural pluralism.

To address these issues this chapter has been divided into three major parts. In the first part is a conceptual framework that will provide a more coherent and comprehensive definition of multicultural education. In the second part are some guiding principles for ways of effectively translating this framework into educational practice. The third part examines the relationship between multicultural education and international studies, or global education, and how the framework for multicultural education can be extended to international studies.

Development of Conceptual Framework for Multicultural Education

Historical Background

A historical perspective is essential in order to fully understand the concerns and issues with which people in the field are grappling today. The historical antecents of multicultural education are usually traced back to the period between 1880 and 1920 when the massive immigration from Eastern and Southern Europe was taking place. This massive influx of humanity, called the largest migration in human history, created severe social problems.

In the face of all these problems, the flood of immigrants was viewed with great alarm by the dominant, native-born WASPs and triggered the reactionary Nativist Movement. Starting in the late 1800's, this movement reached its zenith during and after World War I and was directed primarily at White ethnic groups of Eastern and Southern European origins. The result was widespread violence against these groups, including several lynchings.

Nativism was aided and abetted by the so-called Americanization Movement, whose proponents wished quickly and forcibly to assimilate the millions of new immigrants into the mainstream of American society. The public schools played a major role in this movement through their intensive efforts to Americanize the children of the immigrants.

During this same era, IQ testing was started on a massive scale. Almost two million military draftees were subjected to IQ tests during World War I. Since their average IQ scores were found to be 10 to 15 points below those of native-born WASPs, the claim was made that persons of Eastern and Southern European origins were genetically inferior in intelligence. These findings were later used to argue for the passage of the National Origins Quota Act of 1924. This law severely restricted further immigration from the countries of Eastern and Southern Europe on the grounds that persons of such origins were of inferior racial stock.

As a result of the Nativist and Americanization Movements, millions of White ethnics were forcibly and traumatically acculturated into the American mainstream. The almost total obliteration of the cultural identities of these groups, which are only now being painfully revived, testifies to the brutal effectiveness of these movements.

Sad to say, only a few voices, such as that of the philosopher Horace Kallen, were raised in protest against this unreasonable demand for complete assimilation on the part of the new immigrants. Kallen was among the first to articulate the philosophy of cultural pluralism which he argued was a more democratic alternative to Anglo-conformity. However, the protests of Kallen and other pluralists were ultimately overwhelmed by the powerful forces of Americanization and the growing industrial corporate state.

During the past two decades, however, the philosophy of cultural pluralism has experienced a strong revival, largely as a result of the social upheavals of the 1960's. Most Americans were quite unprepared for the outbreak of the urban riots in the 1960's, and shocked by the militant, highly ethnically-conscious movements by Blacks and other minorities that subsequently followed.

As a result of their involvement in these struggles, many minorities became much more aware of the pervasiveness of the Anglo-conformity bias in the schools and increasingly concerned about the damage this bias was inflicting on the minds of their children. Such concerns led to demands by various minority groups for ethnic studies as an alternative to the existing Anglo-centric curriculum of the schools.

In the early 1970's, two other developments gave further impetus to the eventual development of multicultural education.

One was what Michael Novak has called the "rise of the unmeltable ethnics"--the rising ethnic consciousness of those White ethnic groups, predominantly of working-class backgrounds, who had been subjected to the Americanization process.

The second, almost simultaneous development was the Feminist Movement. Many of the issues raised by the feminists, such as sex discrimination and the low self-expectations of women, were not unlike those being raised by White ethnic groups and those raised earlier by minorities.

It has been within the context of this ferment of conflict and change that the concept of multicultural education first evolved some 10 or more years ago. The concept grew out of the recognition that all of these movements of minorities, White ethnics, and women were basically seeking the same ultimate goal; namely, a more democratic society in which there would be greater equality in all spheres of life.

Through this evolutionary process, multicultural education appears to have been first conceived as Multiethnic Studies; that is, as a consolidation of Asian, Black, Hispanic, and Native American studies. It was then broadened to incorporate White ethnic studies. More recently, many of its advocates have included feminist viewpoints. Given the obvious difficulties involved in trying to incorporate the diverse perspectives and concerns of all these groups, it is not surprising that so many widely-differing conceptualizations of multicultural education have evolved.

Re-examining the Concept of Cultural Pluralism

With that cursory review of the historical background to the development of multicultural education, we can now re-examine the concept of cultural pluralism. This concept is usually taken to be the fundamental basis for multicultural education; in fact, multicultural education has been defined as the institutionalization of the concept of cultural pluralism in the schools.

However, most definitions of cultural pluralism in use in the field are rather fuzzy. Generally, cultural pluralism is defined in terms of an ideal multiethnic society in which various ethnic groups have mutual respect for each other, enjoy equal rights, and are able to preserve and foster their cultural traditions.

Unfortunately, such definitions have a number of limitations and inadequacies, which have not only left multicultural education quite vulnerable to its critics, but have also sometimes led to misguided notions about the goals of multicultural education. Therefore, consider some of the more serious limitations and inadequacies in such definitions.

First of all these definitions place too much emphasis on the culture of an ethnic group. They seem to imply that if each ethnic group is able to maintain its culture, the problems of racism, sexism, and class inequality--the major societal concerns that led to the development of multicultural education--will somehow disappear. This is a rather naive view that ignores the complex causes of these problems.

Second, these definitions do not adequately convey the two-sided dialectical nature of cultural pluralism. It is not enough to say that there will be unity with diversity. Critics have charged that the promotion of cultural pluralism will lead to unbridled ethnicity and intensify conflicts between ethnic groups. Such charges arise because insufficient attention has been paid to this dialectic between the particular aspects of an ethnic subculture and the universal aspects of the larger common culture.

To take an extreme example cited by Harvard sociologist Orlando Patterson, suppose an ethnic subculture believed in human sacrifice as one of their religious practices. Now the question is: Would this practice be allowed by the larger society under a policy of cultural pluralism? The answer would clearly be *no*--particularly if they were sacrificing people outside their own ethnic group! In such a situation, they would undoubtedly be forced to conform to the society's universal prohibition against murder.

A less extreme but more controversial example is the issue of abortion. Is that murder or isn't it? Here we have a conflict over whether a value should be universal or particularistic. Pluralistic societies are often faced with many such questions and must resolve them based on some theory of justice that weighs the rights of individuals and groups against the best interests of the society as a whole. Thus, there has to be a form of cultural pluralism in which universal and particularistic values would be dialectically balanced against each other. For example, cultural pluralism must incorporate the universal values of equality, freedom and democracy, as well as the particularistic values associated with the maintenance of cultural diversity. Unfortunately, this two-sided nature of cultural pluralism is rarely underlined and, as a consequence, it is often misunderstood as license for runaway, laissez faire ethnicity, rather than as a way of avoiding such ethnocentric behavior.

Third, these definitions seem to promote a cultural relativism according to which all aspects of every ethnic subculture are seen as worth maintaining and respecting. This type of cultural relativism can and has been criticized on several grounds. For example, it has misled some into romanticizing an ethnic subculture, even to the extent that they accept oppressive or exploitive elements of that subculture as enriching and worth respecting. Such a romantic view overlooks the fact that ethnic subcultures are continually changing under the influence of many forces. An ethnic group must often adapt to these forces to survive, even as it struggles for self-determination. This complex dialectical interplay between necessity and autonomy may produce both strengths and weaknesses in an ethnic group's subculture.

Finally, these definitions assume that the changes necessary to reach the desired state of cultural pluralism can be achieved within the existing social structure. However, we have to realize that the social structure of a society can exert a strong influence on the development and interactions of the various subcultures that constitute that society. In this regard, it is significant that an increasing number of social analysts are coming to the conclusion that the social structure of most modern, industrialized societies are quite incompatible with the envisioned state of cultural pluralism. They believe that the nature of technology, the huge impersonal bureaucracies and the increasing centralization of power in these societies have severely intensified alienation as manifested by the growing sense of powerlessness and lack of meaning in life felt by more and more people. So, unless changes in attitudes, values, and human relationships are accompanied by fundamental structural changes, cultural pluralism will remain only a utopian dream.

That completes the critique of the concept of cultural pluralism. Is there a better alternative to offer? Despite the criticisms, the concept of cultural pluralism should certainly not be abandoned . However, the concept must be expanded beyond culture and attempt to describe alternative social structures that would be more compatible with a culturally pluralistic society. Perhaps a better term for this extended concept would be socioeconomic cultural pluralism. A description of this concept in a very general way follows in the next section.

THE IDEAL PLURALISTIC SOCIETY

The development of an ideal society compatible with cultural pluralism would require the elimination of most of the centralized bureaucracies, large corporations, and over-congested urban centers, and their replacement by a decentralized system of self-governing communities. These communities would be egalitarian in nature and would be governed as participatory political and economic democracies in which everyone is insured of a decent standard of living, individual, and group differences are respected, and the rights and freedoms of all individuals are guaranteed. Each of these communities would establish its own priorities and methods and develop a large degree of economic and technological self-sufficiency within the context of maintaining a sensible ecological balance. Finally, all of these communities would cooperate with each other within a larger framework of regional, national, and international coordinating agencies.

Basically, decentralized structure is described, as opposed to the present highly-centralized structure. Thus, the pluralism is both structural and cultural, and can be referred to as a socioeconomic cultural pluralism. There are some good reasons for proposing such a structure, but it would take too long to develop them here.

In any event, this description of the ideal pluralistic society is admittedly rather vague and general. Moreover, one could probably say, "So what! Why talk about such a utopian dream? Besides, what good is this vision of a better society for the purposes of multicultural education?"

In answer to the first question, "So what! Why talk about such a utopian dream?", it can be said that the ideal pluralistic society may possibly be an achievable dream, not an impossible one. In fact, there are significant developments in this direction taking place even now. Some of these include the development of more appropriate forms of technology that increase self-sufficiency and reduce pollution, community-based urban rehabilitation projects, the establishment of community land and housing trusts, the recent actions of consumer interest groups to reduce the monopoly power of multinational corporations and the growing interest in decentralized economic systems, to name only a few.

Furthermore, there are certain critical global trends, such as the increasing scarcity in the world's natural resources, over-population, the ever-widening impact of environmental pollution and the growing demand by Third World countries for a new international economic order, that may push us even faster toward such a society. This is not to say that the ideal pluralistic society will be realized in a few short years, or even in our lifetimes. However, there is a significant trend in that direction, which makes one hopeful that such a society may be an achievable goal toward which we may at least aspire.

Which leads to the second question: "What good is this vision of a better society for the purposes of multicultural education?" Perhaps John Dewey provided the answer to this question when he wrote that "the conception of education as a social process and function has no definite meaning until we define the kind of society we have in mind;" that is, until we have defined our vision of an achievable better society. Dewey believed that students should be prepared not for a defective existing society but for an ideal society in which the highest human ideals are achievable and toward which their aspirations could be directed. This perspective provides a conceptual framework for multicultural education.

Premises

The first premise is that the schools are not meeting the educational needs--neither academic nor social--of many racial and ethnic minorities, particularly those who are poor, because they are victimized by the sociocultural milieu of the schools.

The second premise is that the bases in the sociocultural milieu of the schools are victimizing all students.

Third, that while schools preach a lot about democracy, freedom, and equality, the social structure of most schools promote values and behaviors that are quite antithetical to these ideals.

Fourth, that the schools cannot avoid transmitting values.

Fifth and finally, that while the schools cannot operate independent of the prevalent culture and act as the primary means of changing society, they can still play a significant role.

Definition of Multicultural Education

Multicultural Education is a multidisciplinary educational program which provides multiple learning environments that properly match the academic, social, and linguistic needs of students. These needs may vary widely due to differences in the race, sex, ethnicity, or sociolinguistic backgrounds of the students. In addition to enhancing the development of their basic academic skills, the program should help students develop a better understanding of their own backgrounds and of other groups that compose our society. Through this process, the program should help students learn to respect and appreciate cultural diversity, overcome ethnocentric and prejudicial attitudes, and understand the socio-historical, economic, and psychological factors that have produced the contemporary conditions of ethnic polarization, inequality, and alienation.

Such a program should also foster the students' ability to critically analyze and make intelligent decisions about real-life problems and issues through a process of democratic, dialogical inquiry. Finally, it should help them conceptualize and aspire toward a vision of a better society and acquire the necessary knowledge, understanding, and skills to enable them to move the society toward greater equality and freedom, the eradication of degrading poverty and dehumanizing dependency, and the development of meaningful identity for all people.

This formulation is only a tentative, working definition. Embedded, sometimes implicitly, in this definition are several broad and general goals of multicultural education. Some of these goals pertain to students and others to teachers. To make these goals more explicit, there follows a list of some of the major, long-range goals that are embedded in the definition.

GOALS FOR STUDENTS

1. Students should be helped to develop positive feelings, attitudes, and perceptions toward their own and other ethnic groups and develop a better understanding of their own ethnic background and those of other groups that compose our society.
2. Students should be helped to acquire knowledge, understanding and appreciation of the experiences and contributions of racial minorities, White ethnic groups and women in American society.
3. Students should be helped to overcome their stereotypes of ethnic groups, transcend their ethnocentrism, and gain an understanding and appreciation of the related concepts of cultural pluralism and democracy.
4. Students should be helped to understand the nature of pluralism and interethnic conflicts, including the basic causes of racism, sexism, and poverty and recognize the need for depolarizing such conflicts.
5. Students should be helped to develop their ability to critically analyze and make intelligent decisions about complex societal problems and issues through a process of democratic, dialogical inquiry.
6. Students should be helped to acquire knowledge of the historical and social realities of American society in order to increase their understanding of pressing societal problems and how they may possibly be solved.
7. Students should be helped to conceptualize and aspire toward a vision of a more equitable and democratic society, and develop the skills, knowledge and commitment to enable them to create the necessary changes leading to such a society.

GOALS FOR TEACHERS

1. Teachers must acquire knowledge, understanding, and appreciation of the experiences and contributions of racial and ethnic minorities and women in American society.
2. Teachers must understand the nature of pluralism and intergroup conflict in American society and the basic causes of racism, sexism and class inequality.

3. Teachers must develop a sound, coherent philosophical and pedagogical rationale for Multicultural Education, and acquire knowledge of the basic principles of designing and organizing multicultural curriculum in all subject areas.

4. Teachers must acquire knowledge and skills in identifying, evaluating and utilizing multicultural curricular resources, including human and institutional resources in the community.

5. Teachers must learn how sociocultural factors influence learning and how to diagnose the learning styles and needs of students from different sociocultural backgrounds to maximize the academic and social development of every student.

6. Teachers must understand how their attitudes, values and expectations can affect the motivation and performance of students, particularly those from sociocultural backgrounds different from their own, and how to transcend their sociocultural biases.

7. Teachers must acquire knowledge of various multicultural approaches to teaching, including those that utilize dialogical and cross-cultural techniques to enhance and personalize learning and to create a more democratic classroom environment.

8. Teachers must acquire the necessary knowledge and skills in human relations for effectively managing a classroom of students from diverse sociocultural backgrounds, including the mediation of interethnic conflicts.

9. Teachers must be able to help students increase their academic achievement level in all areas, including basic skills, through the use of multicultural materials and teaching approaches that are sensitive and relevant to the students' sociocultural backgrounds and experiences.

This listing of goals completes the development of a conceptual framework for multicultural education. It should be readily apparent that this framework perceives multicultural education to be of relevance to all students, regardless of their ethnic backgrounds. In fact, in many respects, the need for multicultural education may be as great in all-White, middle-class schools as in schools with multiethnic populations.

Guiding Principles for Translating Theory into Practice

To facilitate the translation of the conceptual framework into classroom practice, a number of guiding principles are suggested. The ten principles listed have gradually taken form through eight years experience in working with elementary and secondary teachers involved with implementing multicultural education and in teaching many of the same teachers through in-service courses in multicultural education. A selected number of these principles follow.

Principle No. 1: The first principle is that Multicultural Education should start 'where people are at.' Basically, this is just a different way of stating John Dewey's well-known principle that the education of children should consider their sociocultural backgrounds and begin with the experiences they bring with them into the classroom.

In terms of multicultural education, the principle simply means that everyone should begin by examining their own ethnic identities and background first. Its importance lies in the fact, shown by many studies, that the self-concept of children can strongly influence how well they do in school.

Interestingly enough, through experience in working with teachers and students, it was found that members of White ethnic groups often have the least knowledge of their ethnic backgrounds. For many of them, ethnicity is almost a dirty word or a taboo subject that should not be probed. If this is the case, this is where one has to begin. In fact, one of the first things to do in both preservice and in-service courses is to have people look into their ethnic backgrounds.

Principle No. 2: The second principle is that Multicultural Education should help decenter people and, thereby, help depolarize interethnic hostility and conflict. As mentioned earlier in the critique of cultural pluralism, multicultural education should not simply result in increasing ethnic consciousness but must be followed by a process of decentering. Otherwise it could indeed do more harm than good.

One effective way for decentering people is to use their ethnic background as a cross-cultural bridge by showing parallels between their group's experience and that of other ethnic groups. For example, many White ethnics--like racial minorities--have also been victims of oppression and discrimination. However, due to a rather curious social amnesia, many people never learned about or repressed this unpleasant aspect of our historical past. Increasing awareness of such parallels in experience can help develop mutual understanding and empathy between different ethnic groups and contribute to the process of depolarization.

Principle No. 3: The implementation of Multicultural Education should be approached as a long-term process that will not produce dramatic, overnight changes in schools.

Principle No. 4: Multicultural Education should ultimately be integrative, comprehensive, and conceptual. Teachers who are just getting started in the field may wish to begin with small, specialized units of instruction, however, a more effective approach over the long run is to incorporate multicultural concepts and perspectives into the total curriculum. While this is most easily done in the language arts and social studies, it can even be done in science, mathematics and physical education with some thought and effort. In this respect, multicultural education need not be conceived as a specialized area of education but as a general approach to all areas of education.

Principle No. 5: Multicultural Education should produce changes not only in the content of the curriculum but also in the teaching practices and social structure of the classroom. Most classrooms are not exemplary models of democracy in action. Studies have shown, for example, that rules of classroom behavior and conduct are usually established unilaterally by the teacher and rarely in collaboration with students. They have also shown that teachers ask most of the questions, which usually require rote-recall answers of low-level facts. Students are rarely engaged in true dialogue in which they are stimulated to do most of the questioning and participate in higher-level analysis and critical evaluation. These aspects of classroom interaction patterns constitute part of the so-called "hidden curriculum" that transmits powerful subliminal messages to students and subtly socializes them toward conforming, passive behavior which is quite dysfunctional for effectively participating in a truly democratic society.

Teachers must be willing to change their teaching practices in ways that will make their classrooms more democratic. One approach, among a number of others, that has great promise in this regard is the dialogical approach of Paulo Freire (1970) who originally developed it to teach illiterate peasants in Brazil how to read. Properly adapted to American schools, the approach can dramatically increase student-initiated dialogue in the classroom and greatly stimulate critical thinking. The approach also has major implications for curriculum theory and design.

Principle No. 6: Multicultural Education should be affective as well as cognitive, and should relate to issues that are personally relevant to students.

Principle No. 7: Multicultural Education should help students increase their academic achievement in all areas, including basic skills, through the use of teaching approaches and materials that are sensitive and relevant to the students' sociocultural backgrounds and experiences.

Principle No. 8: Multicultural educators should utilize multicultural resources in the local community and increase the involvement of parents in the education of their children.

Principle No. 9: Multicultural Education must consider the social and historical realities of American society and help students gain a better understanding of the causes of oppression and inequality and ways in which these social problems might be eliminated. This principle is included because many teachers often consider only the more superficial aspects of multicultural education by introducing students to ethnic foods, holidays and costumes.

On the other hand, many teachers avoid considering such issues as racism, sexism and class inequality. However, these other factors are among the most important issues which multicultural education must explore.

Principle No. 10: Multicultural educators must understand that the care, understanding and sensitivity they show toward their students may, in the final analysis, be the most important influences on their motivation and performance. After all that has been said, this principle may still be the most important one for teachers to keep in mind. In my opinion, there is no such thing as a "teacher proof curriculum." Unless teachers are sincerely concerned about their students and seriously committed to educating them, none of the principles discussed earlier will ultimately lead to the desired results.

At the same time, I wish to hasten to add that good and sincere intentions on the part of a teacher is not enough. In fact, the detrimental effects of monocultural education discussed earlier may have even more insidious and damaging effects on children if they are unconsciously promoted by a well meaning teacher who is sincerely concerned about his/her students. Therefore, if teachers wish to effectively implement multicultural education, I believe it is essential for them to acquire the knowledge, skills and attitudes that are embodied in the principles that I have set forth above.

Multicultural Education in the Context of International Studies

Discussed below is the relationship between multicultural education and international studies, or global education, and how to extend the framework for multicultural education to international studies. In many respects the domestic problems and issues being addressed in the field of multicultural education, such as the racism and inequality faced by minority groups, may be seen as a microcosm of the global problems and issues being addressed in the field of international studies. For example, as the economic gap between the have and have-not nations continues to grow, the Third World countries, which constitute the bulk of the have-not nations, have become increasingly concerned with the racism and inequality being manifested on a global scale. These countries do not see as incidental the fact that most of the have nations are largely White and that the have-not nations, containing about 75 percent of the world's population, are largely non-White.

Consequently, more and more of these nations, such as the OPEC and coffee cartels, are uniting to collectively demand the establishment of a new international economic order that would result in a more equitable distribution of the world's resources. Unless these economic aspects of international relations, including the enormous impact of multinational corporations on Third World countries, are included as an essential part of International Studies, any efforts to increase cross-cultural understanding through such studies may ultimately have little meaning.

By developing the connections between multicultural education and international studies we can measureably increase our understanding of both fields. In our ever-shrinking world we clearly can no longer consider domestic problems and issues in isolation from the rest of the world. This fact was brought home rather painfully to many Americans during the past decade as a result of such events as the Vietnam War and the Iranian Crisis.

Today, international events touch almost all spheres of our lives. We can not fully understand domestic phenomena without viewing them from a global perspective. For example, recent dislocations in the nation's economy can only be fully understood through analysis of the dynamics of the international economic system, such as the actions of the OPEC nations and the relocation of the production facilities of many multinational corporations to Third World nations.

Another example is the global shift in the patterns of international trade. Since the founding of the republic, this country has conducted the bulk of its international trade with Europe. However, beginning in the 1950's, there has been an increasing shift in this trade to the Third World nations, particularly in recent years to the nations of the Pacific Basin. In fact, this country's trade with the countries of the Pacific Basin, especially the Asian countries, now exceeds that with Europe and is projected to be many times greater over the next few decades.

As a result of this major change in international trade patterns, the financial capitol of this country can be expected to shift within the next decade or two from New York City to Los Angeles, and the entire Western United States will undergo and, in fact is already undergoing, a profound transformation due to the huge influx of capital. Since we know that cultural transformation usually follows closely on the heels of capital transformation, we can expect that the various Pacific Basin cultures will increasingly influence and transform American culture, which is presently rooted primarily in European culture.

Interestingly enough, while domestic phenomena may be more fully understood from a global perspective, conversely we may better understand the plight of the Third World countries by studying the situation of minority groups in the United States. In fact, there are many parallels and in view of these parallels it seems that International Studies could be taught more effectively if it would begin with the study of minority groups in our own society and then relate their experiences to those of people in the Third World countries. By viewing the global situation from the perspective of minorities, students are likely to develop greater understanding and empathy for the plight of the poor in other parts of the world.

Such parallels can be used to make learning about other cultures much more meaningful to students and far more relevant to their personal lives. Too often people study other cultures from a distance, viewing them in the abstract as something foreign and outside the realm of their experiences. They may acquire a lot of actual knowledge and cognitive understanding of these cultures, but little feeling, empathy, and sensitivity toward them. In fact, many may be familiar with the so-called "expert" in international relations, who has a vast store of factual knowledge about another culture but at the same time displays an almost incongruous lack of sensitivity, sometimes even faintly-veiled contempt, toward members of that culture.

It seems that such cross-cultural gaps could be bridged for many people by having them study and directly interact with people of different cultures within the United States, who are generally far more accessible than people in foreign countries. Moreover, since such ethnic subcultures are an ever-present reality of American society, they are far more difficult to study in the abstract, impersonal way in which "exotic" foreign cultures are often studied. In any case, Americans should have some understanding and feeling for the subcultures in their own society before studying cultures outside of it. If people do not have an appreciation for the cultural diversity within their own society, they are not likely to develop an appreciation for it in the world at large.

Finally, cross-cultural learning cannot be primarily cognitively oriented; that is, it cannot be focused only on factual knowledge, logical analysis, and abstract reasoning to the neglect of the affective, experiential dimension of learning. True cross-cultural empathy and sensitivity can only be acquired through immersion in cross-cultural learning experiences that arouse feelings and emotions. Yet, feelings and emotions are generally suppressed in schools since most teachers view them as inhibitors of learning. However, as studies have shown, if feelings and emotions are properly directed and controlled, they can be powerful stimulators of meaningful learning experiences and can enhance greatly cross-cultural learning.

Feelings and emotions are generally aroused by sensitive issues that hit close to home and often produce some anxiety in students. For example, such issues as racial name-calling, ethnic identity, and racially-based peer relationships and how they develop among students are among the more potent issues with which students are concerned. The discussion of such issues in the classroom can be used by a skilled teacher to give students a deeper, more personal understanding of the broader social issues that affect international relations. In such ways, multicultural education can be used as an effective bridge to help students gain greater cross-cultural understanding of the more abstract and distant global issues which international studies must address, particularly for the vast majority of students who can not afford to go abroad.

A Conception of Education for a Democratic Society

The development of the framework begins with a description of a vision of an ideal society. As can be seen below, this is the same description presented in the framework for multicultural education.

Toward a Better Society

> One conception of a better society would require the elimination of most of the centralized bureaucracies, giant corporations, and over-congested urban centers, and their replacement by a decentralized system of self-governing communities. These communities would be egalitarian in nature and would be governed as participatory economic and political democracies in which everyone is insured of a decent standard of living, individual, and group differences are respected, and the rights and freedoms of all individual are guaranteed. Each of these communities would work out its own priorities and methods and develop a large degree of economic and technological self-sufficiency within the context of maintaining a sensible ecological balance. Finally, all of these communities would cooperate with each other within a larger framework of regional, national, and international coordinating institutions.

Goals of Education for a Democratic Society

Democracy/Equality

- Teaching students the concepts of democracy, freedom, and equality.
- Teaching students about the present state of democracy.
- Helping students conceptualize and aspire toward a vision of a more equitable and democratic society.

Cross-Cultural Understanding

- Helping students develop a better understanding of their own ethnic backgrounds and of other ethnic groups that comprise our society.
- Helping students transcend their ethnocentrism and appreciate and respect other cultures.
- Helping students develop an understanding of and a commitment to universal human rights.

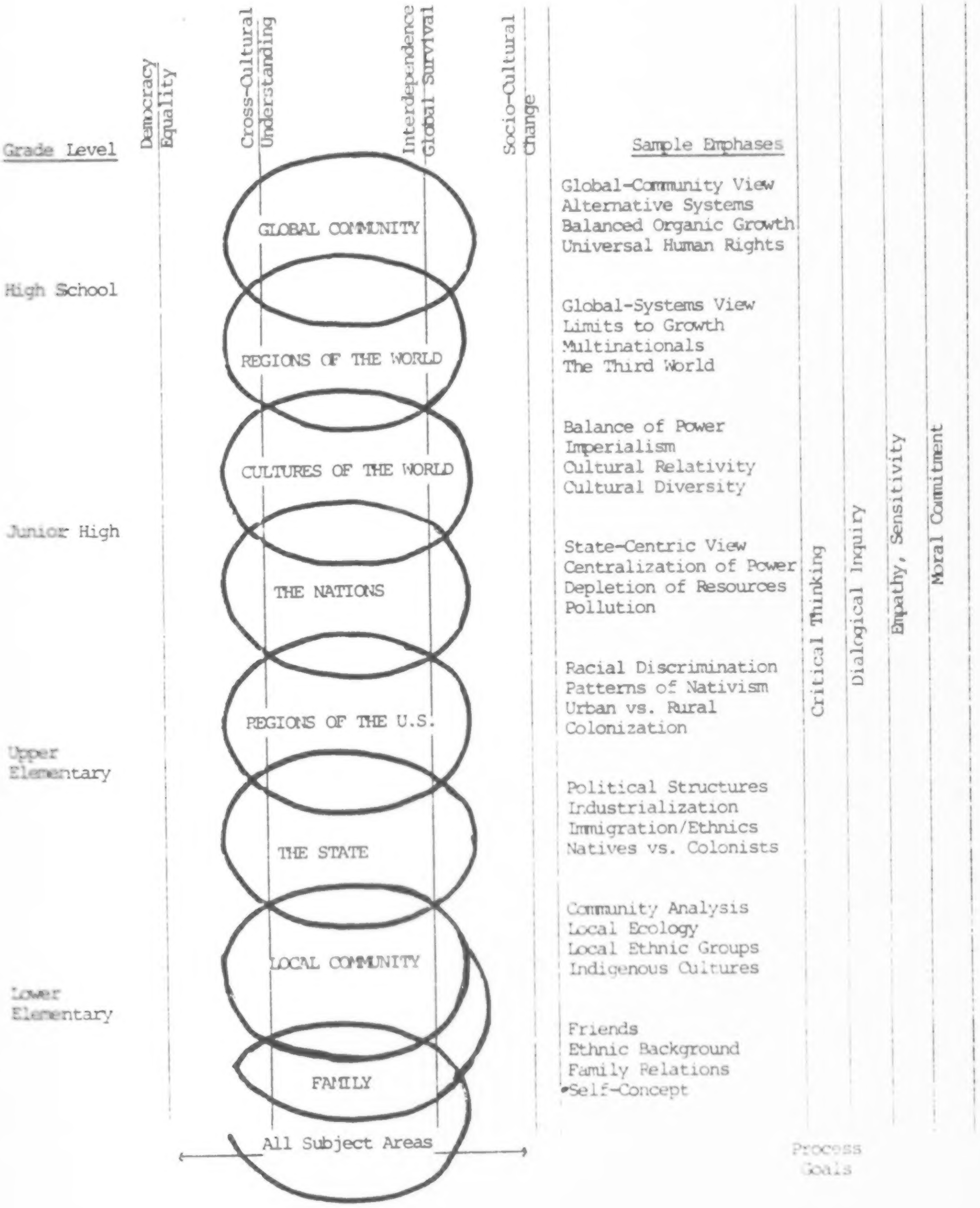
Interdependence/Global Survival

- Teaching students about the interdependence of all the peoples of the world and the values needed for human survival.
- Teaching students about the impending crises facing the world and the need for a global-community view of the world.
- Teaching students about alternative national and international economic and socio-political systems.

Socio-Cultural Change

- Helping students understand the socio-historical, economic, and political forces that have led to the impending crises facing the world.
- Helping students develop their ability to critically analyze and make intelligent decisions about pressing societal problems and issues through a process of democratic, dialogical inquiry.
- Helping students develop the knowledge, skills, and commitment to enable them to create the changes leading to a better society.

The translation of these goals into a curricular framework is illustrated in the following diagram.


Grade Level
Democracy Equality
Cross-Cultural Understanding
Interdependence Global Survival
Socio-Cultural Change
Sample Emphases
GLOBAL COMMUNITY
Global-Community View
Alternative Systems
Balanced Organic Growth
Universal Human Rights
High School
REGIONS OF THE WORLD
Global-Systems View
Limits to Growth
Multinationals
The Third World
CULTURES OF THE WORLD
Balance of Power
Imperialism
Cultural Relativity
Cultural Diversity
Junior High
THE NATIONS
State-Centric View
Centralization of Power
Depletion of Resources
Pollution
REGIONS OF THE U.S.
Racial Discrimination
Patterns of Nativism
Urban vs. Rural
Colonization
Upper Elementary
THE STATE
Political Structures
Industrialization
Immigration/Ethnics
Natives vs. Colonists
LOCAL COMMUNITY
Community Analysis
Local Ecology
Local Ethnic Groups
Indigenous Cultures
Lower Elementary
FAMILY
Friends
Ethnic Background
Family Relations
•Self-Concept
All Subject Areas
Critical Thinking
Dialogical Inquiry
Empathy, Sensitivity
Moral Commitment
Process Goals

THE SPRIRAL DEVELOPMENT OF CONCEPTS

Education for a Democratic Society

This diagram has been adapted from an earlier model of curriculum development first formulated by Hilda Taba, (1962) a curriculum theorist. It represents the most comprehensive and ambitious framework in which the total curriculum in all subject areas is organized around the four major concepts presented above. Some of the features of this diagram are:

1. First, each of the four concepts with their associated goals provide a common thread connecting all grade levels from lower elementary through high school. Each of the concepts may be exemplified both in the domestic context (Family, Nation), which is the realm of Multicultural Education, and in the global context (Cultures of the World, Global Community) which is the realm of International Studies.
2. Second, note that the curriculum would begin with a focus on self-concept and the family and gradually decenter the student toward the community, the state, and so forth, toward greater degrees of abstraction through a spiral development of concepts.
3. Third, note that some examples of the types of subtopics that might be covered under each major topic at a given grade level are also shown on the diagram. For example, at the junior high level one major topic listed is "Cultures of the World," under which the subtopics "Balance of Power," "Imperialism," "Cultural Relativity," and "Cultural Diversity" are listed.

4. Finally, the process goals shown on the right-hand side of the diagram refer to certain process dimensions of learning, such as critical thinking and dialogical inquiry. These process goals, like the four concepts mentioned earlier, are also common threads through all grade levels.

Implications for Curriculum Development

Following are the implications of this framework for curriculum development. There are several ways in which this framework can be applied in developing curriculum.

1. TOTAL CURRICULUM, K-12

   Provides framework for all subjects, all grade levels. Not likely to be implemented in most school systems.

2. SINGLE SUBJECT, SEVERAL GRADE LEVELS

   Provides framework for single subject taught across several grade levels; e.g., social studies at the K-6 levels or at the junior high or high school levels. May also be applied to other subjects such as language arts, science, art, etc.

3. ONE GRADE LEVEL (Replace grade levels on diagram by time during term)

   Provides framework for all subjects at one grade level; e.g., it may be applied to an integrated day approach in an elementary classroom.

4. SINGLE SUBJECT (replace grade levels on diagram by time during term)

   Provides framework for a course at the junior high, high school, or college level.
   Example: Outline for College-Level Course on Global Education:

   I. Culture, Cultural Change, and Education

   II. Pluralism, Social Class, and Education

   III. Sociocultural Forces and Education

IV. Global Survival and Education

V. International Relations and Education

VI. Education for a Democratic Society: Goals and Practices

5. GENERAL EDUCATION (Replace grade levels on diagram with sequence of courses)

Provides unifying, interdisciplinary framework for a college-level General Education program.

The most comprehensive and ambitious application would be to use it in developing the total curriculum of a K-12 school system. However, such an application would require sweeping curricular changes in all subjects at all grade levels. Realistically speaking, such changes are probably not feasible in most school systems.

There are, however, more limited and less ambitious ways of applying the framework. One such way is to apply the framework to a single subject which is taught across several grade levels; for example, social studies at the K-6 levels.

Another less ambitious application is to use the framework to develop curriculum for all subjects at one grade level; for example, by using it in conjunction with an integrated day approach. In this case, the grade levels on the diagram should be replaced by time during the school term.

Perhaps the most feasible application of the framework would be to use it in developing a single course in a particular subject. As an example, there is listed the outline for a course taught for many years on Global Education which was based on the framework.

One other possible application of the framework is to use it for the purpose of developing a college-level General Education program. In applying the framework for this purpose the grade levels on the diagram should be replaced by the sequence of courses that comprise the General Education program.

Conclusion

It is becoming increasingly clear that the next two to three decades are going to be extremely critical ones in which the very survival of humanity may be at stake. Even some of the most sober-minded analysts are predicting that we will face a number of unprecedented crises within this period of time. As mentioned earlier, these crises include the very real possibilities of massive starvation, worldwide pollution, the depletion of nonrenewable resources and nuclear holocaust. All of these crises could occur within our lifetimes and certainly within the lifetimes of the students who are presently in the schools. If we are to prepare these students to avert these crises, we must develop a broader, longer-range view of the purposes of education.

It is hoped that the conceptual framework for multicultural education presented will contribute to the development of such a view among educators. In fact, if educators provide the necessary vision, idealism and leadership, then multicultural education will not become just another passing fad but will remain a significant force in American education in the years ahead.

However, educators are presented with a tremendous challenge that will obviously not be easy to meet in these difficult times. Nevertheless, educators have always prided themselves on their dedication to higher human ideals and will, hopefully, be equal to the challenge. Despite the prevailing cynicism, continuing budget cuts and the growing attacks on education teaching, as a profession, is one of the nobler, more significant and most spiritually rewarding areas of human endeavor. Schools are one of the few institutions in our society where idealism and the vision of a better society can still be promoted and, consequently, the schools have a crucially important role to play in our society; particularly in the next few decades as we face problems and crises of unprecedented dimensions.

To be an educator in these days of Proposition 13, Proposition 2½, Reaganomics, and increasing fiscal crises, one has to be an optimist to stay in education. To be a multicultural advocate in education, one has to be an incurable optimist! It can only be hoped that a lot of you are of the incurable variety.

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THE INFORMATION AND SYNERGETICS REVOLUTION: IMPLICATIONS FOR EDUCATIONAL LEADERSHIP CHANGE

Linda J. Groff

Theses Concerning Education and Change From A Futures Perspective

It is fashionable today to critique our educational institutions, and to offer various remedies, including a return to basics. A somewhat different tack is taken here. It uses a broad futurist approach to look at several of the major technological and societal trends impacting upon all our institutions today, including educational institutions. One objective is to better understand these changes, so that education can take a leadership role, rather than a reactive role, in responding to these changes. Another objective is to show that educational institutions are not alone today; indeed, all our institutions are in crisis, because of the onslaught of change sweeping the planet. Two overriding changes that are especially affecting education and all our institutions will be examined, i.e., the impact of the information revolution, and the impact of the new holistic/synergetic/systems world view (to be defined below). Also examined will be what it means to be living in a learning society today.

The thesis is that all the institutions in the United States and developed world are in crisis, as movement is made from an industrial to a post-industrial, information society, and as change occurs from a segmented, piecemeal, static view

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of reality to a holistic/synergetic/dynamic and interdependent systems world view (or overarching paradigm). Like all institutions, educational institutions are also in crisis today, as they scramble around trying to understand and adapt to the above two changes. These two changes will be examined in general and as they are specifically affecting our educational institutions today.

Another related hypothesis about change today will also be examined, as it affects all institutions in general, and as it affects educational institutions specifically. This hypothesis is that during any period of major change, such as that being experienced on the planet today, society always changes faster than institutions. Institutions are usually slow to change, as they often try to continue supporting an old order or value system because of their vested interests. However, when society changes, often due to the major restructuring effects of new technologies (such as computers and telecommunications), it creates new needs and demands. If the old, established institutions do not adapt to these technological and societal changes and initiate needed changes within their institutions, then new organizations and institutions will arise which are more in-tune with the times and willing to experiment with new policies, programs and actions. Some of these will work and some will not. Eventually, those that do work, and which are more adaptive to the times, will need to be absorbed by the traditional institutions or they will not survive.

Explored in greater depth will be what the above hypothesis means for traditional educational institutions, which clearly no longer have a monopoly on the function of education or learning in society. It will also be noted that other institutions in society are experiencing a similar loss of their former monopoly of control over their particular societal function or service. This is what tends to happen to all institutions (if they are unable or slow to adapt) in a period of rapid technological and societal change.

Finally, also examined will be the effects of the information revolution on education in general today, namely, that a learning society is being created and that lifetime learning is becoming the new norm. This has great implications for people's leisure time and for the knowledge and education business. The real question, however, is whether this function will be performed largely by traditional educational institutions or by a range of alternative types of learning centers or educational institutions?

The Computer/Telecommunications/Information Revolution and the Creation of a Post-Industrial, Information Society

A number of futurists seem to concur that society is in the midst of a massive computer/telecommunications/information revolution, which is totally restructuring society, the economy, jobs, and all other institutions.[1] Daniel Bell (1976) first talked about this in his book, The Coming of a Post-Industrial Society. A more recent book which helped to publicize this thesis and major societal shift to the mass public was Alvin Toffler's (1980) The Third Wave. Basically, Toffler hypothesized that society has gone through three major waves or periods of change in human history, i.e.:

- An agricultural revolution, lasting thousands of years, in which people settled and then lived and worked on the land and grew food and agricultural products.
- An industrial revolution, lasting 200-300 years, in which people moved to the cities to work in factories, and in which manufactured goods were the primary products of society.
- An information revolution (what Toffler calls The Third Wave), fueled by the impacts of computer and telecommunication technologies, lasting 30-40 years, in which information (which is unlimited) is the new primary product, along with services of society. This information revolution is also creating what some people are calling the "learning society." Toffler says that we are in the midst of the information revolution now, and he does not know what will follow after that.[2]

One thing is clear, however. The computer/telecommunications/information revolution (or whatever one wants to call it) is totally restructuring society and all other institutions. Institutions must adapt to the onslaught of all this change if they want to survive.

Toffler's book looks at a number of societal implications of this information or Third Wave society. Another book which also focuses on this same subject and which is also highly recommended is John Naisbitt's (1982) Megatrends: Ten New Directions Transforming our Lives and Yoneji Masuda's (1980), The Information Society as Post-Industrial Society.

There are several overriding effects of the computer/telecommunications/information revolution on society that are quite dramatic and important, and that are affecting all our institutions.

One of the first effects is that the computer/telecommunications revolution is becoming, in effect, the nerves of the planet, linking everyone electronically and making everyone instantly aware of what is happening elsewhere in the world. In this sense, the world and its peoples are truly becoming more interdependent globally.

At the same time that humans are becoming more globally interdependent, the computer/telecommunications revolution is also creating an opposing trend as well, i.e., it is facilitating the decentralization and diversification of society's interests. In short, the industrial age created a mass-based society, with centralized institutions focused around the nation-state, in which there was mass production of goods, mass education of people, mass politics, mass media, etc. and in which everyone was treated the same, and this was considered democratic.

In contrast, the post-industrial information age is allowing society and its institutions to decentralize and its people to diversify their interests. People--with the aid of computers, telecommunications, video, cable, satellites--have the increasing opportunity to work at home if they choose (Toffler's electronic cottage), or to work in a centralized office (as in the past) and, likewise, to get an education at a traditional educational institution (as in the past) or at home via television, video, or computer.

In short, a multiple-option society is being created, with an explosion of information and media options--for work, education and entertainment. People increasingly can choose from various computer hardware/video technologies to get information from or do work; as well as choose increasing numbers of different computer software or video programs on ever more diverse topics to learn from.

While it used to be considered democratic to have everyone studying the same material in schools, seeing the same programs on television, and consuming the same mass-produced products, with the advent of the information age people increasingly are demanding diversity and the option to follow their own particular interests of the moment. Students also increasingly want to learn not only what they want, but at their own pace and in their own time schedule. Computers and telecommunications technologies can aid in this process. These expressed option clearly have enormous implications for education in general and for our traditional educational institutions in particular.

There are two other issues relating to the impact of the information revolution on education. The first issue is the crisis that education faces because of rising human and material costs (due to inflation) and decreasing budgets. Something is going to have to intervene to cut educational costs while still ensuring that needed, quality educational services are provided. It seems obvious that the most likely candidate to do this is a proliferation of computer hardware (one of the few items coming down in price today), and increasingly user-friendly (easy to use) computer software. There also is a proliferation of high quality video learning packages (which can be shown on a television set via the aid of either cable, direct satellite broadcast, a videocassette recorder, or a videodisc player--all of which can be hooked to a television set either at a school/university or in one's home).

Such video products (which can capture the best teachers on video for everyone to see, and which are just beginning to invade the educational market), can be coupled with two-way interactive television such as Cube TV in Ohio so students can respond back to the material they see, or to a teacher or discussion leader who can be in a totally different location. These products promise to be an increasing wave of the future in education for various reasons: convenience of being able to learn from other places besides a centralized school, possibilities of high quality programs, and cheaper costs.

It has also been noted that, as computers increasingly take over rote learning, students will be permitted to learn at their own pace and teachers will have more time for quality interaction with students. It has also been shown that ghetto children, who have been turned off to learning, have been turned on again by computers which challenge everyone to "figure-out" their internal logic and which also treat everyone using them the same (i.e., computers do not discriminate).

For all of the above reasons, one can expect our traditional educational institutions--as indeed all our institutions today--to be fairly radically transformed via the effect of computer and telecommunications technologies, and the accompanying information explosion which they are making possible. At present, many teachers are not yet aware of the full implications of this information revolution, including its media (computer/telecommunications) component, which is likely to expand enormously in coming years.

Another crisis which teachers are facing is that, in many cases, children are adapting to the new technologies better and faster than adults, who are the teachers and who are the generation caught between the old ways of learning and the new ways. Children increasingly grow-up with video games, computers, etc., as a natural part of their environment (as telephone and television were for earlier generations), whereas for adults computers are often seen as foreign or threatening. Nonetheless, computer software is becoming more user-friendly and easier to use all the time.

When we talk about the goal of computer literacy for everyone, as a prerequisite to function effectively in a future (not too distant) society, this does not mean that everyone needs to learn how to write their own computer programs from scratch and become a computer programmer. It only means they need to be able to sit at a computer, type information into it (often in the form of simple answers to questions asked by the computer on a television screen, or monitor, in front of them).

Once voice-activated computers become perfected it may only mean they will have to be able to talk to a computer, to read information or their answers into a computer in response to questions asked them verbally by the computer. In short, it is becoming easier and easier to use a computer and this trend will continue.

A final issue concerning the impact of the information revolution is the importance of setting as a goal--both nationally and globally--that all people gain access to this explosion of information about all aspects of life, from the very micro, subatomic level, to the very macro astrophysics level and everything in between. This information is needed by people to further facilitate their own economic development and self-reliance, though within an increasingly interdependent and interconnected world.

The importance of everyone gaining access to information is because in an information society information is power (not wealth or resources as in the previous industrial age). Because information confers power and influence on people, many people are legitimately concerned that the information society will develop into those with access to information (the "haves") versus those without (the "have nots"). In a transition period, this seems to definitely be true, but it also underscores the very democratizing potential effect on society of the goal for everyone on the planet to have immediate access (via computer/telecommunications technologies) to whatever information they need at the moment (for their own economic development, health, etc.) or to whatever information interests them at the moment. In this way, increasingly, everyone on the planet can learn about whatever they want or need to learn and also can connect them locally, regionally, nationally and globally with others having similar interests.[3]

If more and more people gain access to the information they need, get turned-on again to learning, then there could be the possibility (as Buckminster Fuller often said) of a "swift telecommunications revolution." This revolution could gain momentum quickly and help propel humankind into a new age and into a globally viable and interdependent civilization which is so desperately needed today.

So, while the computer/telecommunications/information revolution can be abused (as can any technology) and used to create new elites, it also has the potential to help liberate humankind in a fairly rapid way and help shift from crisis and breakdown to solution and breakthrough.[4] If everyone becomes conscious that this more positive option also exists, then more and more people can commit their lives to helping this option be realized in their lifetime.

At the moment the clock is ticking on whether "spaceship earth" (to use Fuller's term) and humanity will survive and make it or not. The best guarantee that it will is if increasing numbers of people start committing their lives to trying to make the planet work for 100% of humanity. Surely, making needed information and positive options for the human future available to all humanity is an important aspect of achieving this goal.

The Synergetics/Holistic/Systems Revolution in World View and Thinking

Most educational institutions are generally aware of their need to understand the impact of computers (and less so telecommunications) on society and on education, and have begun at least initial explorations of this subject. There is another major change in our overarching paradigm or world view that is also occurring, which is just as important in its implications for society and for education. However, people in general, and our educational institutions in particular, are much less aware of it yet. This is the major shift from a segmented, static, one-point-in-time, compartmentalized world view (associated with Newtonian physics) to a more holistic, synergetic, dynamic or living systems perspective. This new perspective sees everything as constantly changing, interdependent, and part of an evolving whole system (associated with Einsteinian and Quantum physics, which are often referred to today as the "New Physics").[5]

The holistic health and consciousness movements, which are springing up widely in mass culture today are other examples of this new holistic worldview.[6] So are ecological views of reality or dynamic systems models (such as the Club of Rome's computer models of dynamic systems, which show a number of interrelated variables within the global system evolving over time).[7] Indeed, general systems theory and living systems theory have emerged as whole new areas of study in recent years.[8] The picture of the earth from space is another beautiful symbol of whole systems thinking on the global level--where the earth can be seen as a vibrant, interconnected, living system without national boundaries dividing it.[9]

The above examples of whole systems thinking mark a major shift in how we look at and experience reality. Toffler also refers to this as the shift from a primary focus on analysis--examining ever greater detail of ever smaller parts of the whole, thus losing the forest for the trees (the major world view during the industrial era) to a primary focus on synthesis--seeing the dynamic and evolving relationships between disparate information and parts of the whole, as well as the patterns emerging within systems, and within the massive information unleashed in this information revolution (the new paradigm or world view for the information age).[10]

When we look at our educational institutions today, we can readily see that they are not structured on a dynamic systems/holistic/synergetic world view. Instead, information is compartmentalized into different departments and disciplines, whose members often focus more on what separates them from their colleagues in other departments than on any underlying similarities of interest or overlapping interests. Nonetheless, some of the most interesting research and questions today are occurring in interdisciplinary areas where hypotheses are tested in more than one discipline and common patterns of living systems (no matter where they occur) are seen to emerge.

The computer revolution will help make it possible to study data from many diverse fields but academia will need to develop new learning modules which transcend traditional disciplines and take a whole systems perspective.

Suggested Areas for New Educational Policies & Initiatives

It is interesting that when one looks at education today there are several glaring inadequacies, in terms of what society and the world now need in order for all humanity to survive and prosper in coming years. A few examples follow:

- Today students largely study the past and the present, not the future--even though massive changes are occurring today which will forever change the world where all students will be living and working in the future.. (Indeed, most of the changes that futurists talk about are changes that are already occurring today, not at some far off future date.) Thus education, if it does not help students to understand these changes via future studies-type courses, is not adequately preparing students for their own futures.
- Students also get largely compartmentalized learning, of different subjects as separate parts of reality, with little effort at synthesis, leaving it up to them to try to determine how all these disparate subjects fit together. A responsible curriculum today would also include at least some interdisciplinary, whole systems courses.
- Education must also teach students that it is a globally interdependent world where vents elsewhere increasingly

impact upon lives here and vice versa. In a world increasingly linked via modern communications, trade, travel, economics, etc. a detached, uninformed or isolationist attitude toward world affairs will no longer suffice. Today the survival of each of us is tied to the survival of all and education should address itself to this fact.

- Clearly some minimum amount of computer literacy will be essential for people to function in their work, as well as home, environments in the future. Until voice-activated computers are perfected, this means that people will need to know how to enter information on a keyboard, i.e., they will need to know how to type.
- Despite the current availability of calculators (for math) and spelling dictionaries as software for use with computers (to check for correct spelling) and the eventual availability of voice-activated computers, this writer believes that education must continue to teach students at least minimal reading, writing, and math skills so that they can function adequately in the contemporary world and as a precondition for later self-directed learning by students.
- Some people also believe that education is too linear, left-brain, logical and rational without adequately developing right-brain capabilities (the source of creativity, spacial/artistic abilities and intuition).

Education should be balanced and develop all parts of the brain.

- Instead of compartmentalizing work and education, some people believe today that more combined work-study programs would greatly benefit students and give them a greater appreciation of the relationship between abstract ideas and their practical applications in the world of work and life in general.
- Education could also do more to give students, faculty, and community a stronger, more positive vision of the future and of the human potential. This vision would call people to their higher selves and empower them with a sense of community and world service, to help humanity through this great and dangerous but exciting transition period in world history--where we must build a truly global civilization that increasingly works for all humanity--if we all want to survive and prosper in this nuclear age and in the future.
- This may seem heretical to academia, but if we are going to learn to live together on this planet, then all the age-old conflicts and animosities between peoples will somehow have to be healed. This will require not only good ideas (on which people often differ) but also open and forgiving hearts. It will also require a recognition of our basic humanity (and common interest to survive) that unites us, as well as our unique differences, which if allowed to flower in positive ways can help everyone to

contribute in their own unique ways to making the planet work. Education needs to recognize that a whole person is also a loving person who feels connected to fellow human beings and to the planet. Education could do more to foster such universal attitudes and feelings of connectedness, responsibility, and concern for others.[11]

What all the above educational suggestions are really saying is that education increasingly needs to address itself to the whole person, i.e., to all the aspects of a person's being (physical, emotional/heart, intellectual, and spiritual/intuitive), as well as to the whole planet and to our collective humanity, aspirations, oneness, and interconnectedness on this planet. The more everyone takes responsibility for healing old wounds and helping create a new world civilization that works for everyone, the greater the chance that this can occur.[12] We must all do our part locally to create a globally interdependent world that works. Anything short of that will not be enough to survive in the nuclear age. In short, our basic connectiveness--to other human beings, to all life, and to the planet--must be stressed increasingly by our educational institutions. This is part of whole systems thinking.

Can Our Traditional Educational Institutions Respond to the Challenge of Change, or Will Alternative Organizations and Institutions Arise to Meet the Challenge?

Having elaborated two major societal shifts affecting all our institutions--the information revolution and the synergetics revolution--and having noted areas in which traditional education falls short of its potential to steer and direct change today, we will now look at the bottom-line question relating to our educational institutions today. In short, can our traditional educational institutions adapt to the above changes or will other organizations and institutions increasingly take over the new, innovative functions in education, thereby increasingly leaving our traditional educational institutions on the garbage heap of history? Educational institutions must comprehend the enormity of the technological and societal changes affecting them and take a leadership position in directing these changes and in preparing people for life in the latter part of the twentieth century and beginning of the twenty-first century.

To date it is fair to say that the traditional educational institutions are still largely resisting or reacting to the changes rather than leading the changes. In many ways, high technology companies are certainly out front in the technological component of this information revolution since they are producing this technology. Indeed, the computer/telecommunications field is extremely fluid and changing very rapidly today: New computer models hit the market every month and high technology in general changes every two to three years, putting great stresses on these companies and their employees. Since educational institutions are not on the cutting edge of this new technology today, one consequence is that corporations are creating their own learning centers to train and keep their own employees abreast of all the technological, management, and other implications of this change. In the future, however, greater collaboration between high technology companies which have the technology, and educational institutions which educate our youth and adults will need to occur if society as a whole is to become computer literate.

Community learning centers and alternative educational programs and schools (which are also proliferating), are further examples of how traditional institutions are losing their former monopoly on the educational/learning component that any society requires. Media is another area that is just beginning to make inroads on traditional education. With the fast-paced development of computer hardware and software and video technologies, cable, and satellite, learning and education via various media packages are becoming an obvious trend, again increasing the options (in a multiple option, information society) of how individuals receive information and learn.

Whether traditional educational institutions will ever again regain the sole or primary responsibility in society for learning and education is clearly debatable. The trend is in the opposite direction at present. If educational institutions want to survive and be back on the cutting edge of change, they will have to: (1) incorporate these new technologies into their curriculum;[13] (2) develop new learning packages, in terms of content which address all these technological and societal changes and the need for whole systems thinking; and (3) also create a much wider range of educational programs (beyond traditional degree programs), including certificate programs and other shorter programs to update one's skills in a particular area.

The general principle at work is that if traditional institutions do not adapt to the massive changes society is undergoing, then counter organizations and institutions, which are willing to experiment with new models and programs, will arise.[14] If successful, these new organizations will replace the traditional institutions (unless the latter later incorporate these changes).[15] The future of our traditional educational institutions is open: What happens to them depends on how ready and creative they are to change.

Some Final Thoughts on the Learning Society and on Lifetime Learning

Due to the information revolution and accompanying explosion of technology and information (which becomes obsolete faster and faster, guaranteeing that an education will not last long in terms of the information learned), there is general agreement that we are becoming a "learning society" and that "lifetime learning" will become the new norm for everyone. People are also living longer,[16] and the work week is expected to continue to shorten as society increasingly automates certain of its production functions with the aid of computers and robots, thereby creating more leisure time for people. One effect of this change is that people will increasingly have more leisure time to pursue their particular interests of the moment--meaning education and learning will play a crucial role here.

Another interesting effect of longer lifetimes, the increasingly rapid pace of change and the impact of the computer/telecommunications/information revolution, is that most people have, according to various estimates, at least seven different jobs in their lifetime and three different careers or, according to another more recent estimate, up to eleven different jobs (Snyder, 1983). This means that everyone will have to be updated in any given field of work or retrained into whole new fields at various times throughout their life.

In the new information age it will be the unskilled workers who are worst off with fewer jobs available to them. These workers will need retraining which society and government and corporations have only begun to attempt.[17] Again, this will be an important educational function for society, which some institutions will have to undertake.

The main concluding point to make is that education and learning are already big business in this country. Indeed, education is already the second largest industry in the United States (with health care and medicine being number one). By 1990 education is projected to be number one according to at least one futures forecaster (Snyder, 1983). The key question, however, is how involved or not our traditional educational institutions will be in this ongoing educational/learning function required of a rapidly changing, learning society in an information and synergetics age.

FOOTNOTES

1. For this writer's summary of the literature on this subject see Groff, 1983.

2. For some speculations on what may follow the information revolution based on diverse futures literature and trends in different areas see Groff, 1983.

3. Jean-Jacques Servan-Schreiber, 1981. Also conversations with Mark Siegmund in Los Angeles, 1983, concerning his goals of taking the information revolution to the Third World.

4. I am indebted to Barbara Marx Hubbard (1982) for this evolutionary perspective on how to view crises as "evolutionary drivers," which can be converted from negative to positive triggers of change. For another good book with an evolutionary perspective see Russell, 1983.

5. For two excellent books which document the characteristics of this shift see Fritjob Capra's two books. The Tao of Physics; and The Turning Point. The former book examines the "New Physics" and its parallels to mystical views of reality which are also holistic. The latter book discusses the applications of the new dynamic systems paradigm from the "New Physics" to the other social sciences and medicine. Another good introduction to the "New Physics" is Zukav, 1979.

6. For an excellent introduction to these movements and their underlying world view, as well as to new and parallel scientific worldviews see Ferguson, 1980.

7. See two of the most well-known and early global systems models and studies by the Club of Rome, namely: Donella H. Meadows, et al., 1972; and Mesarovic and Pestel, 1974. Key variables included in these global models are population, food, energy/resources, environmental pollution, technology, etc. For a brief summary of the literature on global modeling and some of the key global models available see The Tarrytown Letter (1982).

8. For the best overview and introduction to living systems theory with examples of its application in various areas, see Miller, 1978. See also the work of the Society for General Systems Research.

9. For a further discussion on this new whole systems perspective and examples of its application in various areas see Groff, 1983.

10. See Alvin Toffler, 1980.

11. Please note that this idea that everything in the universe is connected to everything else is fundamental to the "New Physics" view of reality, which has found that there is no such thing as a detached, objective observer. One's mere presence in an experiment or situation effects the results.

12. Please note that R. Buckminster Fuller, author of Utopia or Oblivion, Critical Path, Synergetics, and numerous other books, and creator of the geodesic dome and other inventions and designs, has documented via his World Game that there are enough resources by far to go around and to satisfy everyone's physical needs on the planet. The major problem, he claims, is that nation-states, which are obsolete, still operate based on the false assumption of scarcity and, therefore, conflict. A new win/win strategy globally (also necessary for the nuclear age), must, therefore, replace our old competitive win/lose strategies, based on conflict and scarcity. In a nuclear war no one wins, so for the first time in history it behooves us all to learn to live together on this planet. Whether we can learn to do this or not is the big test that humanity is collectively facing right now and it will determine whether this planet has a future or not. Surely education has a potentially crucial role to play in this process.

13. Computer literacy is obviously a prerequisite for survival in the future and students raised on television are also much more likely to learn if education is not only left-brained (as verbal, reading skills are), but also right-brained and visual, taking advantage of the proliferation of video technologies.

14. An interesting and parallel example today is traditional medical institutions (medical doctors, hospitals, and the AMA), which held a near monopoly in the medical/health area. However, their primary focus on treating disease once it has occurred, rather than preventing disease and promoting health and wellness (which are now important social movements of interest to many people, who increasingly want to take responsibility for their own health) means that an enormous wellness industry has arisen, based on holistic health, nutrition, healing, etc., which traditional doctors and medicine are only now beginning to consider.

15. A parallel and related example is third political parties, which have arisen in American politics in periods of change to advocate new issues or a new philosophy (when the two traditional political parties did not), only to have their ideas later absorbed by one or both of the traditional parties, once they realized the significance of such ideas. For a

further elaboration of how all our institutions are under stress and in crisis today as a result of the information and synergetics revolutions see Groff, 1983.

16. Several books which introduce this whole subject of life extension and reversing the aging process include: Kent, 1980; Kurtzman and Gordon 1976; Pearson and Shaw, 1982; and Walford, 1983.

17. So far one study shows that of automobile workers who have been laid off from work, most will not be rehired since they are being replaced by robots and automation. Only 3% of those laid off have found information-industry type jobs. The rest have found service sector jobs at lower pay than their previous jobs, indicating that not that much successful retraining of auto workers into more technical, skilled jobs has occurred (at least not yet).

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RETHINKING EDUCATIONAL EQUITY:
RESTRUCTURING EDUCATION FOR AN INFORMATION SOCIETY

Shirley McCune

1983 may be called the year of a new level of educational awareness--the increasing importance of education and training systems as strategic resources for our economic system, the need for the restructuring of education, a renewed attention to the role of state policy and decision makers, and the emergence of a new set of educational equity issues. There is a growing consensus that our society is in a profound transformation process of moving from an industrial to an information society. The restructuring which is under way in our society gives cause for great optimism and great concern.

Every society must consider the fundamental issue of how roles and resources are to be assigned and allocated. In the past, education and training played a major role in the sorting of individuals and groups for various roles. Indeed, the history of U. S. education could be portrayed as the successive expansion of educational opportunity and access to various groups. Today we face a new set of challenges in maintaining and extending educational opportunity.

Quality education and training is becoming a more important resource. Individual access to quality education is likely to become a more critical variable in the determination of life outcomes. In any time of significant change and restructuring, there is the temptation to wait and see what the

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impact will be on various groups in the population. Given a two-hundred-year history of struggles to extend the rights of various groups and provide a greater degree of equal access and an intense twenty-year period of educational equity reform, a wait and see attitude is unacceptable.

Although we cannot predict all of the probable changes, we can assume that the groups with fewer resources and experience in full educational participation will be those most at risk in any restructuring of our society. Each of us must engage in the review of known trends and data; the extension of our understanding of the likely, the implications and the design of action that can overcome the potential regression of existing levels of equal opportunity and increase the continued progress toward the goal of quality education for all students.

This paper will address the following issues for the purpose of examining:

- The larger economic context for rethinking education issues in general and educational equity issues in particular
- The society context for restructuring of education systems
- The areas for the restructuring of education
- The state roles which may be performed in the restructuring of education
- The use of strategic planning as a process for designing actions for restructuring the role of education
- Initiating the strategic planning process--environmental scanning.

The examination of the above issues has as its goal to provide information, stimulate questions, and provide background information. These issues are not designed to be comprehensive or finished, but rather they are provided as a resource for deliberation.

An Economic Context for Education

There is general agreement that one of the critical issues facing the United States today is the maintenance and renewal of an economic system which can meet the needs of the American people. The United States, long a leader in world productivity and the establishment of a high standard of living, is now confronted with four major structural changes in its economic system:

- After more than three decades of rapid technological growth and innovation, the United States economic system has been dramatically restructured from an industrial economy based largely on manufacturing, to an information economy based largely on service and information activities.
- The United States economic system has become part of a global economic system and our future is inextricably bound with the economic systems of other nations.
- United States productivity and growth has declined over the past 15 years and other countries are closing the gap between their productivity levels and that of the U. S.
- Future economic and social well-being will depend, in large measure, on the ability of the U. S. to continue to provide the cutting edge technology for the rest of the world, demonstrate the ability to move a product quickly into production and proceed to the next generation of products.

If the United States is to respond to the urgency of these changed conditions, it will require an economic renewal program of a magnitude seldom seen in U. S. history. Such an economic renewal program must be built on a competitive strategy which will enable U. S. business and industry to provide high-quality products at prices which are equal to or better than other world producers. This is increasingly difficult in that other countries can exploit their resources of raw materials, cheap labor or available capital in any form of competition.

The primary resource upon which the United States must rely is a basic increase in productivity, that is, the ability to use technology to create more in less time and the ability to develop new processes, products and knowledge. United States workers must demonstrate the ability to work smarter, faster and better than other nation's workers.

Perhaps the central need for designing any program of national economic renewal is the need to develop competitive strategies or plans which can handle the complex issues in any successful renewal program. A competitive strategy for economic renewal must confront the need for increasing our international markets, for continued and expanded technological research and development, for the retooling of a decaying industrial plant and for increased productivity.

A central strategy for each of these needs is to increase the performance of America's work force. A critical resource and component of any economic renewal plan is our education and training systems and their ability to provide the workers who can work smarter, faster and better. Increased involvement in technological applications requires a work force capable of using more sophisticated machines and equipment--a work force that is capable of problem solving and collaboration. It also requires a work force that is capable of understanding and using technology and participating in decision making which requires a basic scientific and technological literacy.

In short, education and training become central activities for economic development. High quality education and training systems are not a luxury in our global, information society; they are a necessity for competing with other nations for world markets and maintaining our standard of living.

Just as there is need for restructuring of the economic system, there is also need for the restructuring of education and training systems. The ultimate outcome or mission of improving and restructuring our education and training systems includes:

- Significantly increasing the pool of highly trained mathematicians, scientists, engineers and computer scientists needed to advance technology and technological applications essential for economic growth.
- Significantly increasing the general levels of knowledge and skills of the total population which, in turn, can increase productivity in all areas, provide a sufficient supply of technicians for high-technology activities and prepare a population capable of consuming information-related services.
- Extending our capabilities for lifelong training and for the retraining of groups within our population whose jobs are gone.
- Raising the levels of human capability and productivity (human capital) in ways that maintain and extend equal opportunity and access for all groups within the population.

Achieving this level of restructuring will require the involvement of all areas of education--postsecondary education, training systems, vocational education and community education programs. The basic building block for a restructuring program begins with public elementary and secondary education systems. Their success is essential to extend the goals and achievements of education at other levels.

The restructuring of public elementary and secondary education programs requires a national commitment and the active involvement of leaders at state, local, and national levels. The restructuring requires:

- Establishing goals, directions, and expectations for educational achievement and mastery of knowledge and skills.
- Increasing the quality and quantity of time devoted to educational and learning activities through extension of the school day, the school year, and more effective involvement of parents and community learning resources.
- Encouraging academic excellence and achievement by measuring individual mastery and improvement of skills rather than artificial time and age requirements.
- Improving the quality and quantity of educational personnel through the attraction of capable persons into the education work force, the continuous upgrading of knowledge and skills, and the measurement of effectiveness according to objective measures of student mastery and achievement.
- Improving the management of education programs by increasing the skills of educational administrators, providing recognition and rewards for improved management, and utilizing exemplary management skills and processes currently used in business and industry.
- Developing and implementing models which can involve business-industry, community institutions, mass media, computer networks and home instruction systems in more systematic and collaborative efforts to improve learning.
- Increasing the rewards and recognition for exemplary education service by providing additional pay, incentive pay for student achievement, developing an excellence recognition program, and increasing the

psychological and learning rewards of education careers.

- Providing the financial resources, technical assistance and support systems necessary for the improvement of the education system.

The task of bringing about the necessary changes in education at the levels needed for economic renewal is not easy. It will require dedicated leadership at state, local, and national levels. Leadership that is aware of the needs and committed to finding solutions that are in keeping with the diverse state and local responsibilities for the provision of education. It will require a continuing attention to the monitoring of equal access and the correction of identified problems.

The Societal Context for Educational Change

The need for some examination of the societal context for change begins with a restatement of the basic, paradoxical functions of education in any society. Education must:

- Maintain the knowledge and experience of the past and transmit it to the youth as a means of their basic preparation for adult roles--in this sense education is a conserving or conservative institution.
- Anticipate the future and design selective knowledge, experiences and skills which will be essential to youth's participation in a future society--in this sense education provides a means to facilitate social change.

Education programs always reflect the values and the goals of a society. The fact that our society produces 1,000 lawyers for every 100 engineers and that Japan produces 1,000 engineers for every 100 lawyers suggests a difference in orientation and values between the two societies. Educators must understand the larger social context and values if they are to be effective in preparing students for full participation in society. Knowledge of this context is essential even when the goal is to change the emphasis and values of the larger society.

The formulation provided in John Naisbitt's book, Megatrends: Ten New Directions Transforming our Lives, and the extension of this data base contained in the Trend Report provides one way of thinking about the larger societal context and the implications for education. John Naisbitt's observation that it is easier to ride a horse in the direction it is already going is useful as we begin to examine the needs for change and the strategies which might be pursued as we work to restructure and improve education.

Some of the "megatrends" or consistent changes which are evident across the various sectors of the society are:

Our society is moving from an industrial to an information society.

Economist Marc Porat indicates that the United States ceased being an industrial economy and became an information economy in 1963, when 53% of the gross national earnings were reported to be in the information sector. Another indication of this trend is found in the employment of the work force. In 1950, 55% of the paid work force was employed in industry; today only about 18% are employed in industry. By contrast, 28% were employed in service and information jobs in 1950 and today more than 56% are employed in these sectors.

This shift in the nature of available jobs raises issues about the emphasis of elementary and secondary education programs as well as the context, enrollments, and support of postsecondary, vocational and continuing education programs. Many have suggested that the importance of basic skills is increased and there is need for developing new levels of the higher order skills of analysis, synthesis, problem solving and creativity.

Our society is moving from a centralized to a decentralized society.

Two primary events--the Great Depression and World War II--served as major stimuli for the centralization of our society. The move in a centralized society was toward big business, big government, big unions and a vertical type of organization. During recent years this trend was reversed and decentralization can be seen in the New Federalism proposals, the emphasis on block grants and a general trend to solve problems at state or local levels (horizontal structure).

Within education, this trend is evident in the increasingly important role of state and local governments. It can likewise be seen in the shift in emphasis from using the district as a unit of analysis to using the individual school as a unit of analysis. Greater attention has been focused on the school principal as a key educational leader.

Our society is moving from a national economy to a global economy.

The isolation that characterized American foreign policy at the turn of the century is clearly a phenomenon of the past. Today, the condition of our economy depends in large measure on ability to provide goods and services to other countries throughout the world. What happens in Central America, Iran, China, Japan, Russia or any other country of the world can have a profound effect on our economic well-being and the way we organize our lives.

In general, American education has not considered the need to prepare students for being a citizen of a global village as a priority activity. In fact, bilingual education is, in large measure, considered a deficit for students rather than an asset which can be used in productive ways. There is a similar lack of emphasis on understanding the cultures of other countries. These needs are likely to lead to an increased emphasis on foreign languages and the extension of global educational activities and programs.

Our society is moving simultaneously toward high technology and toward "high touch."

When technology is not accompanied by a compensating "high touch" aspect (those activities which contain strong elements of human response), the technology probably will be rejected. The compensating response to the high technology of television was group therapy and the human potential movement. CB radios and walkie talkie systems became a national craze and they have been incorporated into our daily lives because they provide ways for many to maintain communication with other people.

This trend is evident in education by the initial lack of acceptance of microcomputers. Computer-assisted instruction using mainframe or minicomputers has been demonstrated but it was not widely used because it was difficult for students and teachers to have consistent hands-on experiences and utilize their full capacity. The introduction of arcade games and the home computer have changed the picture dramatically.

Microcomputers are becoming an essential component of education programs. Schools are under pressure to acquire them and use them for instructional, administrative and general information processes.

Society is moving from either/or to a society of multiple options.

At one time the choices in education were largely either/or. One was involved in academic programs or vocational programs, in private schools or public schools, in K-12 education, or postsecondary education. Today, the lines are blurring and more options are being provided for citizens. Community colleges are one example of the trend to meet a variety of needs and to continue one's options for education.

Elementary and secondary education programs typically were designed to provide a consistent program for all students in the district. While some options were provided in secondary schools, the choices were comparatively limited. Today we see the magnet schools, alternative school, and enrichment programs as examples of efforts to provide multiple options for students within the educational system. There are magnet or alternative schools for basic skills, science and mathematics, performing arts, language studies and gifted programs. These alternatives are part of a continuing effort to serve the range of values and needs found in nearly every community.

Society is moving from a pattern of institutional help to self-help.

A characteristic of the centralized, industrial U. S. society was the trend of expecting institutions to meet individual and societal needs. This trend was reversed as evidenced in the wellness movement, the increased use of barter, cooperative living arrangements, and self-help networks. The reversed trend is evident in education by the rapid expansion of the use of home computers for learning and educational purposes, the expectations that individuals must fund a greater proportion of their learning costs, and the expansion of school fees.

Other trends which the Naisbitt group have identified include:

From	To
North	South
Business as usual	Accountability
Hierarchies	Networking
Economies of scale	Appropriate scale
Managerial society	Entrepreneurial society
Representative democracy	Participative democracy
Family as basic unit	Individual as basic unit
Party politics	Issue politics
Machismo society	Androgynous society

The social, political, and economic contexts which bring about and are modified by these trends provide the starting point for examining the needs for the restructuring of education programs, policies, and practices. These trends have and will continue to have a profound effect on education. The task must be to anticipate the impact of these trends on education, develop strategies for utilizing or counteracting their impact, and develop action efforts which can lead to positive outcomes.

Restructuring and Improving Education

Any decision for improving education is based in large measure on three key assumptions:

- The information society is now an economic reality and it is rapidly becoming a social, political, institutional, and personal reality.
- Economic institutions have been engaged in a considerable restructuring effort in order to meet the changed conditions of our society; education must similarly involve itself in a basic restructuring process if it is to remain relevant to the needs of an information society.
- Much of the critical leadership essential for the restructuring of education must come from the efforts of local and state leaders.

There are many ways to examine the restructuring needs of education at the state and local level. One way to think about the restructuring of education is to consider the areas where states can influence public (and to a lesser extent private) elementary and secondary education programs and begin to identify likely changes.

States have the responsibility for education programs and they implement this responsibility by developing policies, programs, or laws in six basic areas. These areas and a listing of mechanisms for determining directions in these areas include:

Areas for State Action

1. Determination of state goals for educational programs:
    - curriculum guidelines
    - accreditation requirements
    - testing areas
    - state financing
    - state programs
    - state technical assistance

2. Financing of educational programs:
    - general aid programs
    - special aid programs
    - incentive programs
    - equalization requirements
    - tax incentive programs

3. Preparation and development of educational personnel:
    - preservice education programs
    - program accreditation
    - individual certification
    - funding incentives
    - in-service education
    - in-service programs
    - in-service funding
    - continuing certification requirements

4. Assessment and evaluation programs:
    - state assessments
    - student competency programs
    - teacher/administrator competency programs
    - state program accreditation

5. Governance, outreach and decision-making structures:
    - guidelines for program implementation
    - delineation of responsible authorities
    - involvement requirements (advisory committees, notices, open hearings)
    - grievance and complaint procedures
    - audit and reporting requirements
    - business/industry involvements or incentives

6. Special facilities, schools and programs:

- state facilities (vocational schools, schools for the handicapped, schools in correctional or medical settings, and state residential schools, such as schools for the performing arts or schools for science and mathematics, etc.)
- special programs (summer science camps, scholarship programs, summer institutes, etc.)

Given that these are the key areas where state leadership and direction may be provided, it is essential to identify the ways in which education programs may be restructured. An incomplete outline of some of these changes is provided below as a stimulus for thinking. It is important to understand that the movement from an industrial to an information society does not imply an either/or type of choice, but rather that the items included in the information society lists are extensions of the past and a change in emphasis rather than an abandonment of the past.

Area	Industrial Society	Information Society
Goals of Education	Emphasis	Emphasis
Cognitive Goals	Basic Skills	Stronger, higher order skills
	Specific training	Generalizable skills
	Right to read	Right to excel
	Unicultural	Global education
	Literacy as survival	Many literacies, more than 1 language
Affective Goals	Large organization skills	Small group skills
	Organization dependent	Independent entrepreneur
	Single family orientation	Support group orientation
	Distinct subject areas	Synergistic study areas
	Student as passive recipient	Student as integral part in community

Curriculum	General, diversified	Science and math emphasis
	Print oriented	Computer literacy
	Physical education	Physical/mental well-being
Job Preparation	Single-career preparation	Multiple-career preparation
	Late skill development	Early skill development
	Distinct vocational education programs	Career/vocational education as integral part of educational community experience
Financing of Education	Institutional financed	User financed
	Public sector	Public/private sector collaboration
Delivery Systems	Total district system	Neighborhood models
	Central office oriented	School-based management
	Superintendent focused	Principal focused
	Formal board community leadership	Informal parent-neighborhood leadership
	Business as a consumer of school output	Business as a participant
	Group instruction	Individualized programs
	District structure standards	Neighborhood variations
	Standardized programs	Multiple option programs
Educational Personnel	Teacher as subject matter expert	Teacher helps students get and use information
	Teacher as standards setter	Teacher as self-concept developer
	Principal as middle manager for central office	Principal as manager, curriculum leader, staff developer, and neighborhood contact

	Superintendent as professional educator	Superintendent as politician and integrated community leader with specialized education expertise
	Superintendent as status quo leader	Superintendent as educational leader and community resource developer
Assessment and Evaluation	Diffused routine accountability/assessment	Achievement/performance accountability
	Teacher/administrator performance measured by judgment	Data-based performance measures
	Periodic assessment	Ongoing assessment for educational diagnosis
	Teacher/administrator performance used as baseline standards	Teacher/administrator performance used for incentive pay
Community Relationship	Parent as passive consumer	Parent as participant consumer/decision maker
	School district youth oriented	School district life long learning oriented
	School as isolated educational institution	School as community service institution

State improvement programs begin with some understanding of what works in education. The National Institute of Education has devoted considerable effort in recent years to conduct studies which examine the characteristics of effective schools, effective administration and management, and effective teaching. Some of the results of these studies are summarized below.

The findings of this research may be grouped into two areas--research and the teaching/learning process, and research on the structure and management of schools. With respect to the first area, some of the findings are outlined below:

1. The amount of time devoted to academic learning varied widely. Effective teachers were able to allocate more time for instruction, were able to engage students in learning tasks and engage them when they were performing at high success rates (allocated time, engaged time, and academic learning time).
2. The organization, planning and scheduling of activities were essential to effective classroom management. Efforts to devote time to advanced planning and preparation before the school year began, to train students into a routine of activities at the beginning of the year, and to facilitate effective group relationships among heterogenous students all contributed to effective classroom management.
3. In general, structured programs were more successful than individualized or discovery programs. Effective teachers were able to:
    - structure learning experiences
    - proceed in small steps but at a rapid pace
    - give detailed and redundant instructions and explanations
    - use a high frequency of questions and overt, active practice
    - provide feedback and corrections, especially at initial stages of learning
    - have a student success rate of 80% or higher on initial learning tasks

- divide seat-work assignments into smaller segments or devise ways for frequent individual monitoring of students
- provide for continued student practice (overlearning) so that students have a high success rate and become confident, rapid and firm in their learning

Some of the findings of the improvement literature which are related to the structure and management of effective schools include:

1. There is a strong administrative leadership, usually the principal, especially in regard to instructional goals and outcomes.
2. There is clear school-wide emphasis on basic skills which is agreed to by all members of the staff.
3. Teachers expect that students can reach high levels of achievement and their behaviors communicate this expectation.
4. There is a system for monitoring and assessing pupil performance which is tied to the instructional objectives.
5. The school climate is conducive to learning in that there is safety, order, and discipline.

When the factors which account for success at the local level are understood, then the process of backward mapping can begin. This approach involves identifying the state policies and programs which can support the development, maintenance, or extension of the effective practices. It is this process which requires not only in-depth knowledge of curriculum and the structure of local programs but also the policy making and policy implementation processes of states.

Designing a State Role for Change

The responsibilities for state educational decision making are widely diffused between the executive branch, state boards, state legislators, and state education executives. Each of these groups performs a critical role and many of the functions performed can be initiated or performed by various state leaders. Each state has evolved a structure and method of operation for educational decision making. These are based, in large measure, on the history and traditions of the state, the governance structures, and the styles and interests of the individuals occupying various state leadership roles.

The decentralization of federal initiatives has expanded the role and potential leadership of states. Some states have moved into this expanded role comparatively easily, while others continue to experience difficulty in quality educational decision making.

Quality decision making requires a number of managerial processes. Frequently, these processes are not established in the states and information needed for decision making may not be available. States can be effective in their educational decision making to the extent that they have developed processes or structures for:

1. Comprehensive planning efforts.

   Perhaps one of the most difficult aspects of state education decision making is the lack of structures and processes for planning. Educational planning occurs at a variety of levels--strategic planning which establishes direction for educational programs, operational planning performed by state agency staff with responsibilities for the implementation of programs; program planning by local decision makers, and program delivery by educators. Table 1 outlines a way of considering the responsibilities for planning efforts. States are beginning to move toward strategic planning efforts which would involve key leaders and result in a state plan for education.

2. An in-depth data base on the economic, demographic, educational, and social political factors which influence educational programs.

Just as the needs of states differ widely, so do the needs of individual districts. State decision makers and policy makers need a range of information in each of these areas if they are to make wise state policies. A few states have established computerized data bases which would provide critical information in, at least, some of these areas. There is, however, a continuing need for states to monitor the needs, progress, and status of local districts if they are to tailor policies and programs to the range of state needs.

3. Opportunities for state leaders to meet and learn about policy issues.

One of the characteristics of a centralized society is that persons occupying the same role groups tend to

Table 1

ROLES AND RESPONSIBILITIES FOR STATE EDUCATIONAL PROGRAMS AND ACTIVITIES

Function	Role Groups	Outcomes
Strategic Planning and Management (mission & goals of education, resources, personnel, and assessment guidelines	Governors and State legislators	Statements of goals, state laws & policies, state reports, & assessments
Operational Planning & Management (Specification of progress, guidelines, policies, administration of resources, standard setting, data collection, & evaluation, etc.)	State executive officers & boards (chief state school officers, state higher education executive officers, state boards, etc.)	Administrative structures, guidelines, & services
Program Planning and Management (design of community education programs, day-to-day management of programs)	Local school superintendents & school boards Institutional executives & boards	District or institution program plans, program administration, & evaluation
Program Delivery (direct responsibility for delivery of quality programs)	Local principals, teachers, counselors, & support personnel	Quality of education programs

meet but there are seldom opportunities for leaders with different responsibilities to meet and discuss state education programs and problems. State seminars and other forms of interaction among state leaders are needed as a precondition to understanding differing perspectives and to make maximum use of state resources.

4. Policy analysis capabilities.

   Identifying the potential impact of a proposed law or policy is a critical step in its consideration. Policy analysts are often found working in state legislatures and sometimes with state education agencies. As the responsibilities for decision making are extended to states, there is a need for increasing their policy analysis capability.

5. Assessment and evaluation systems.

   A majority of states have various forms of student, teacher, or program assessment and evaluation systems. They are extremely useful for the state decision making process. In many instances, however, these assessment and evaluation systems are limited or fragmented, and critical concerns or issues are not identified. Considerable attention needs to be given to strengthening and in most instances expanding these systems.

6. Preparation of personnel to perform staff roles at state levels.

   Although some schools of teacher and administrator education provide courses on state policies, few if any provide in-depth training to prepare students for careers in state policy making. Systematic preparation and continuing education programs are essential if states are to remain up to date and effective in their decision making process.

These functions can be upgraded and strengthened in nearly every state and should to be a priority for the improvement of state educational policies and programs.

The following questions are designed to help you think about the actions which are needed to support the restructuring of education in your state and the role which you can perform in doing so.

Status of Restructuring in Your State

- On the basis of your information about educational restructuring in your state, where would you rate the current level of progress?
- Where would you place the priorities for educational restructuring and improvement in your state?
- What steps do you believe are necessary before these priorities can be addressed?
- What components/processes are needed to improve the effectiveness of state leadership, policy and decision making?
- How would you describe the educational leadership in your state in terms of their articulation of needs and in developing support for education programs?
- What do you believe are the critical next steps for the restructuring of education in your state?

Strategic Planning: A Tool for Restructuring and Change

The need for planning programs which can chart a direction or course for the future is acknowledged widely as a need but seldom utilized by institutions or policy makers. Some of the most common barriers to traditional long-range planning efforts are:

- long-range planning is complicated and time consuming.
- planning frequently highlights or extends the gaps between planners and doers.
- frequent changes in governance, administrations, and staff disrupt the process.
- budgets are seldom linked to program goals and plans.

These problems have led to the development of a modified planning process--a process oriented to changes in the environment, a process which uses decision makers' judgments, and a process of continuing review and modification to fit changing needs and environments. The process, developed in business and industry, has potential for application in the public sector.

Strategic planning is described by Baldridge and Okomi (1982) as:

> The central focus of strategic planning is developing a good fit between the organization's activities and the demands of surrounding environments. Strategic planning looks at the big picture: the long-range destiny of the institution, the competition between this organization and others in its environment, the market for organizational products and services, and the mix of internal resources to accomplish the organization's purposes.

The goal of strategic planning is focused on making wise decisions more than producing a set of plans. It emphasizes flexibility and a quick response to changes in the outside environment. It is more concerned with doing the right things than doing things right.

Strategic planning is usually done at the top levels of the organization and it is organized to answer questions such as "Where are we going?", "What business are we really in?", and "What is the future of the organization?" These questions are equally as important to state educational decision makers. Developing the answers to these questions provides a framework for developing operational, program, and tactical plans which are usually performed at lower levels.

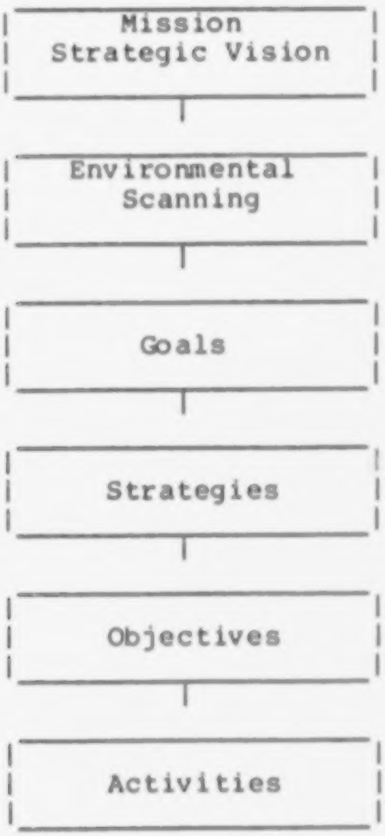
There are a variety of models for strategic planning which may be used but most use two key elements--the development of a consensus as to a strategic vision of what is to be accomplished, and a review of relevant available data (known as environmental scanning). An example of a strategic vision was when President Kennedy articulated the vision of getting a man on the moon. Currently, Governor Robert Graham is articulating the strategic vision of moving achievement test scores of Florida students from 36th place to 3rd place in the nation.

Strategic plans are usually prepared for a two-to-three year period of time, but periodic evaluations and environmental scanning activities are used to review the plan and make any necessary modifications or additions.

If strategic planning is to be effective, it is important that all the key decision makers are involved in the process at some point. Task forces, committees, citizens' boards, school boards, etc. are all examples of groups which might initiate or coordinate strategic planning efforts.

The development of a strategic plan begins with the formulation of a strategic vision or goal which can serve as a motivation for progress. The strategic vision may be limited, e.g., increasing the achievement scores of students in a state from X place to Y place, or it may consist of a number of related goals. Strategic planning is not linear and orderly, but the following provides a visual outline of usual steps in strategic planning.

Strategic Planning Model


Mission
Strategic Vision
Environmental
Scanning
Goals
Strategies
Objectives
Activities

A beginning point for considering the strategic vision is to consider the outcomes of your vision for future education programs. The following questions are designed to help you identify a vision for your state.

Building a Strategic Vision

1. What is your strategic vision for education and training systems in your state?

2. How widely do you believe this vision would be shared among groups in your community?

3. How well does your vision serve the needs of all groups in your community?

4. Look back on your vision for education in your state.

   Does it

   - consider changing technologies--the potential impact and opportunities which it provides?
   - include social sciences and humanistic content as well as the physical sciences?
   - include the need for improved education for all groups in your state?
   - consider the language and cultural studies needed for global participation?
   - respond to trends and the context of the larger society?

5. In what ways, if any, would you modify the vision for your state?

Initiating An Environmental Scanning Process

The "environmental scanning" process was developed in response to the realization that change often happens so quickly that plans need to be revised frequently. Sometimes there will be a need for extensive revision of the plan, or we may simply identify the need for minor changes. Environmental scanning should include consideration of the national economic and social context outlined earlier. In addition, the specific characteristics of the state should be examined. One way of considering ing state factors relevant to education is to consider the demographic, economic, social/political, and educational "situations" in your state.

The following questions are designed to help you begin to identify those factors which are important for developing a strategic plan for your state.

State Demographic Factors

1. What has been the pattern of school enrollments in your state and what is your best estimate of future enrollments?
2. What are the enrollments by grade levels and what is the percentage of the dropout rates?
3. What are the number of students in special programs (handicapped, compensatory education, bilingual education, gifted and talented, vocational programs, etc.)?
4. What is the racial/ethnic composition of the students in the various programs?
5. What are the percentages of female and male students in the various programs?
6. Is there a disproportionate representation of students to programs by race, ethnic group, or sex?
7. What groups within the state do you believe are best served by the schools? What groups do you believe are least well served by the schools?
8. What other demographic characteristics can you identify that are relevant to education programs in your state?
9. What changes, if any, do you anticipate in the demographic characteristics of the state?

Economic Factors

1. What is the general fiscal condition of the state? The districts?
2. What fiscal problems or windfalls do you expect in the future?
3. Where does your state rank in its support of education programs?
4. What programs or activities have been best funded? What programs or activities have been least well-funded?

5. How would you describe the general support of schools and citizens' willingness to provide resources for the schools?

6. What other economic factors are likely to affect education in your state?

7. What are the economic costs to the state of not funding education programs?

Socio/Political Factors

1. How would you describe the general political support of schools in your state?

2. What do you think are the general community perceptions of the state's education and training systems?

3. What types of activities or improvements would the state be most likely to support?

4. What organizations, business, industries, leaders have provided support to the schools and how would you go about increasing this support?

5. What other factors could you identify which affect the socio-political climate of the community and which have relevance for education programs?

Educational Factors

1. Educational programs consist of students, curriculum, and staff. Most improvement efforts address each of these but many emphasize one as a starting point. Some assessment of the current status of each needs to be made before a plan is developed. How would you rate the strengths and weaknesses of each of the following within the schools in your state?

	Strengths	Weaknesses
Student Achievement		
Student Curriculum		
Teaching Staff		
Management Staff		
Support Staff		

2. What actions can the state leaders take to maintain strengths and overcome weaknesses?

	Strengths	Weaknesses
Legislation		
Policies		
Programs		

These processes need to be repeated with key state leaders and reviewed by a variety of groups in the state as a means of increasing involvement and commitment. Task forces, informal conferences, boards, commissions, and other similar groups should be involved in similar processes as a means of developing a consensus for state action.

Based on the examination, identification, and results of the environmental scanning process, goals are established. Once goals have been determined by the key decision makers, the following planning framework to operationalize the goals should be considered:

State Planning Functions

Type of Planning	Questions to be Addressed	Persons Involved	Outcomes
1. Strategic planning and management (state educational goals and mission of the agency). Relevance of state programs to local needs.	Are we going in the right directions?	Top decision makers with input Chief state school officers, governor, board(s), top staff.	State mission statement. State strategic goals. Time line of critical decision points.
2. Program planning and management. Effectiveness of agency activities for implementing mission.	Are we doing the right thing? (To achieve our mission).	Chief state school office and SEA management staff.	Agency program plans with objectives, timelines, and budget allocations.
3. Program delivery and management. Efficiency of agency efforts.	Are we doing things right?	Program and project staff.	Program plans and unit plans.

The State Planning Functions framework provides the context for program planning and program delivery (specifying strategies, objectives, and activities) to begin addressing the strategic vision goals.

In the process of undertaking the strategic planning process, state agencies need to keep in mind three components for maintaining a high level agency-staff capability. These include:

- Procedures for regular staff reporting and interaction among staff which can facilitate coordination and opportunities for staff to learn from each other.
- A continuing information program which keeps staff up-to-date on relevant research, program models, educational policies, and education concerns (the content of state education interest).
- An ongoing effort to extend the process skills of staff (e.g., consultation, training, management, program design and program improvement, evaluation, data system use, etc.).

Perhaps the need for strategic planning can best be summarized in the following chart that outlines the stages in our development toward the information society.

	Agricultural	Industrial	Information
Strategic Resource	Land-Raw Materials	Capital	Data Information
Transforming Resource	Human Energy	Processed Energy	Intellectual Conceptual Ability (apply information)
Time Orientation	Past	Present	Future

When we view this chart, it becomes easier to understand why human capital information is a critical task for all institutions. It also calls for us to realize that the goals, organizations and way of working on an industrial society are not adequate for an information society. Similarly, bilingual education, race and gender equity, and educational programs in general no matter how effective may need to be reexamined and restructured in ways that they are more "in sync" with the needs of an information society.

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EDUCATION IN THE 1990's:
A DEMOGRAPHIC VIEW

Ernest F. Garcia

In December (1982) the Los Angeles Times ran a series of articles on immigration to the United States. Some interesting and revealing facts, with strong implications for schools in the near future, emerged. Since 1975, this country has experienced a wave of immigrants that is equalled only by the period of greatest immigration between 1900-1910. One million legal and illegal immigrants have joined the U. S. population every year since 1975. Recently, the Census Bureau released information about population shifts and growth for the country. The southwestern quadrant of our nation, the area commonly known as the southwest, has received 90% of the population growth since the 1970 census.

Putting the two facts together, we can readily see that the growth being experiencing in California could very well be immigrants from Central America, Mexico, the Middle East, Southeast Asia, Korea, and other countries. The diversity of this immigration is well-illustrated by an evening adult school in Los Angeles which enrolled 9,000 students who are studying English and who represent 81 countries. What implications do these demographic facts hold for education in the 1990's?

In terms of population growth, it is known that the birthrate among the wave of immigrants is higher than those of

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the groups that comprise the citizenry. Therefore, the 1990's will see an increasing number of first generation Americans all the way from kindergarten to the twelfth grade. A language other than English will be spoken in a large number of homes. For those who have been wishing that bilingual education would somehow go away, this must be a disturbing forecast.

In the 1990's, the English monolingual preparing to enter what will surely be a global economy will be at a distinct disadvantage; the job market will be inextricably entwined with other cultures and languages. The issue of bilingual education might indeed become a nonissue because it will be assumed that the educated person meeting the job requirements of a global economy will be multilingual and, if not multicultural, at least knowledgeable about and sensitive to the ways of others. We will be able to look back upon the 70's and early 80's and marvel at the ridiculous argument that occupied us as we debated the relative merits of transition vs. maintenance bilingual programs.

Immigrants in the past had little media support for their language and culture. Enclaves developed native language newspapers that served the older generation but no major print medium gave any support to other languages except perhaps for the Reader's Digest (Selecciones de Reader's Digest), which translated American culture into other languages. No major radio network broadcast in the languages of the immigrants. It was left to local stations to play ethnic music and provide limited programming in the native tongue.

The new immigrants have it much different. Maintenance of culture and language is bolstered by diversified electronic programming that serves linguistically different populations.

We are experiencing a decline in the domination of television by the major networks. In its place we see great inroads by cable and satellite transmission that continue to bring other languages and other cultures into our homes. Immigrants can now tune to native language programming that serves as a vehicle for maintenance of language and culture. The new generation of immigrants will surely learn English but it is doubtful that they will squander the wealth of another language as did that other wave of immigrants in the first 25 years of the century. Cultural diversity will be maintained by high technology. We will celebrate cultural diversity as Americans and once and for all junk the myth of the melting pot. Diversity of languages and cultures will serve us well if we value them.

In an era of global interdependence, our political leaders, our merchants, our scholars, our corporate heads and a multitude of others can ill afford to remain ignorant of the complex ties that bind the many cultures that support the diverse economy of our globe. The World Future Society in its Future Survey (1982) reported that a recent UNESCO study tested 14- and 15-year-olds on their knowledge of other cultures. U. S. students did not do very well. "At a time when more interaction among different cultures is taking place, American students are becoming less knowledgeable about the world around them."

It appears that the 1990's curriculum will be forced into a multicultural social studies format by several factors: (1) there will be a demand for the globally educated, (2) the low level activity which now constitutes what is called teaching the basic skills will be replaced by computer-based instructional systems that will do a much more efficient job in a much shorter time, (3) the inordinate amount of time that is now consumed by basic skills activity will be available for human interaction activity that will stress communication and understanding.

It is obvious that teachers will have to be educated to assume a much more dynamic role. The curriculum for teacher education will have to change drastically. The reality that teacher education is the responsibility of the entire university will become exceedingly apparent.

We will have to learn to plan for the future so that we may have some influence on outcomes. Too much of our preoccupation has been with pastology and not enough with ways in which we can learn from today in order to improve tomorrow. Teachers will have to become much more active futurists. If we believe that thirty percent of the future is already known and that forty percent is knowable through extensive projection and extrapolation, then we ought to go about the business of planning for what can be, rather than accepting que sera sera. Henry Ebel (1972) in his statement on history and historianism points to the safety of writing about the past, "unlike the present, for the past is really not alive anymore because it doesn't - by definition - allow for the areas of choice and possibility that are the very essence of life. It can no longer move 'this way or that way' because it in fact moved 'that way.'"

One can only marvel at the amount of time and energy spent in history classes reliving the past in whatever fantasized form is current. What if that same energy were used to help students use the present to understand probable futures. What if we engaged in less pastology and more futurology?

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"CLASSROOM" OF THE FUTURE: 2058 AD

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Predicting the classroom of the 21st century is at best a precarious proposition. The accuracy of any speculation may well be forgiven, however, since we will not be here to enjoy either its benefits, nor suffer its consequences. Thus, considerable latitude is possible in presenting future speculation regarding the nature of the classroom some 75 years hence. Although purely speculative, some guidance is available from contemporary as well as futurist writings.

Futurist literature reveals a wide spectrum of predications. These range from:

1. The Pessimistic Future. A future characterized by an increasing number of localized wars ending in nuclear destruction, one of overpopulation, end of affluence, increase in societal schisms, and wallowing in our own waste products.

2. The Optimistic Future. A brave new world consisting of new forms of social institutions, a world society/community, end to world hunger and opportunities and developments that we cannot even conceive of today.

There is of course a middle ground between these futures, one characterized by uneven social and technical advances. Despite the wide range of futurist predications several factors are clear:

1. That futurist predications are based on present socioeconomic and political trends.

2. That technological changes and accompanying social changes will occur at an ever accelerated rate.

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3. The ability to control or direct change is predicated on solving the problems noted by the pessimist.

4. Change will be wide range because of vast alterations in technology, urbanization, economics, politics, religion, family and education.

In effect, the future is mitigated by social, technical, and institutional forces which are dynamic in nature, with each contributing to the vortex of change itself. A comprehensive review of the nature of the future is beyond the scope of this presentation and is available elsewhere.

Suffice it to note that, as presently construed, our educational system is largely production oriented. The role of the individual is that of a receiver of information with little or no role in defining one's education. Illich (1970) posits that the present "production" educational processes inhibit rather than produces liberation of human thought. He notes that:

> School teaches us that instruction produces learning. Once we have learned to need school, all our other activities tend to take the shape of client relationships to other specialized institutions.

In other words, educational consumption produces educational demand and schools define achievement through an elaborate and subtle process. Illich proposes that education can only be made truly accessible to all by transferring the responsibility from the institution to the individual.

Buber (1968) indicated that the ideal vision for mankind must be based on human encounter and thus affirms man's essence by relating creatively to the external world. Education, he notes, will undergo violent transformation out of which will come a rebuilding of urban schools through corporate partnerships with educators and students alike.

In effect, schools will change. Although the precise nature and degree of change are uncertain. Contributing to the change will be technological advances and alteration of our social and economic systems. Interestingly, these changes will require self-examination of the human essence in relationship to, and use of, technology. An expected outcome of technological change, it is posited, will be increased freedom for humans to relate to each other more on a human basis.

Maruyama's (1982) Post-Industrial Era logic, illustrated in Table 1, certainly appears possible. As suggested, future emphasis will be placed on social interaction, striving for cultural satisfaction, cooperation, etc. Many of these changes will become evident in the schools of the future; particularly in the area of technological advances, sensory thinking and participatory education.

Table 1 Logic Differentiation

Between Industrial and Post-Industrial Eras

Industrial Era	Post-Industrial Era
standardization	destandardization
homogeneity	heterogeneity
competition	symbiosis
hierarchy	interaction
conquer nature	harmony with nature
material satisfaction	cultural satisfaction
efficiency	aesthetics and ethics
thinking in categories	thinking in social contexts

Technological Advances

Nowhere will the future of education be more affected than by technological advances. Technological innovations have assumed almost geometric growth as evidenced by technical advances in the past 50 years. Life in the 1930's, characterized by the lack of rural electrification, automobiles, or plumbing, little resembles the 1980's as evidenced by electronic communication, satellites, lasers, and jet travel. Given current trends, it appears very likely that technology will contribute to education through:

1. Increased use of teaching machines.
2. Use of computers as central information banks.
3. Mass electronic communication to transmit classroom lessons/lectures.
4. A shift to information processing and data analysis rather than learning of facts.

Technology will, in effect, free humans to go beyond their present cognitive and intellectual abilities and to use much higher order thinking. In brief, the educational system will be infused with innovation. What remains to be seen is the educational system's ability to absorb technological changes. However, it appears certain that the focus and role of teacher as a transmitter of knowledge versus the focus of the pupil as the learner will undergo many alterations. Additionally, our present conceptualization of the classroom will undergo major alterations as will the nature of basic skills instruction such as reading, teaching and thinking.

Sensory Thinking

Biochemical and sensory research has greatly advanced knowledge regarding the interrelationship between biochemical and cognitive functions. Advances in biochemical research in particular would suggest that there will be a place for use of biochemical stimuli to aid learning acquisition, memory function and possibly even behavior modification. This is not to suggest that there will be smart pills, but rather the use of stimuli to facilitate learning.

One would also expect in the future that the school would adjust education to biological and sensory differences between children. Children have varying biological cycles, and varying times of mental, physical and intellectual efficiency which, if considered in the instructional process, could increase learning. For example, children in the future may be attending classes in the evenings when they reach their peak of efficiency and there may be instructional programs which enhance the student's sensory stimuli modes.

Some learners are either sensory reducers or sensory augmentors. The augmentors tend to amplify the visual and auditory stimuli and the reducers tend to reduce the level of stimuli with which they are presented and thus require much higher stimuli. In addition, the growing interest in psychic phenomenon of the brain will likely expand into a new science. Students will experiment with learning to alter their consciousness to enhance cognitive expansion as a means of sensory learning.

There may be some great temptation for school personnel to manipulate the educational destinies of their students using biochemical and sensory stimuli. It, therefore, becomes critical for society to determine the extent of biochemical and sensory stimulus goals in education so as to protect the personal freedom of each individual to realize their own potential. Parents and teachers must share in the process of teaching human values and the development of critical thinking skills with a sense of moral responsibility. The ultimate goal for which to strive rests on recognition of the basic equality and worth of all human beings and their highest possible protection.

Participatory Education

As the structural aspects of education change, so will the role and relationship between the teacher and learner. One can expect the role of the teacher as conduit of knowledge will change to one of an educational broker. That is, future teachers will not teach facts per se but rather act as learning facilitators--guiding learning, acting as intellectual leaders, counselors, and as a resource. Professional managers will manage the technical aspects of educational networks, while teachers focus on their roles as mentors. Similarly, students will begin formal schooling much earlier, by age 3-4, and by the early teens will play a major role in becoming responsible for their own learning, which will be facilitated by microcomputers, learning machines, and instantaneous electronic and video communication with data banks.

The focus on learning in the future will be on analytical skills building, synthesis, and application of data rather than acquisition of facts. Educational competition, as known now, will give way to educational cooperation and striving for intellectual and creative excellence for the general welfare.

The language of education is certain to undergo rapid transformation. There will be educational languages rather than just English as a medium of learning. Technological shorthand will replace previous modes of written expression as illustrated in the following comparison of languages:

> Do godamoighty know what a's doing a-oakin' o' mea?
> I beant wonn as sows 'ere a bean an' yonder a pea;
> An' Squoire 'ull be so mad an' all--a' dear a' dear!
> And I 'a managed for Squoire coom Michaelmas thutty year.
>
> Northern Farmer - Tennyson

> Leucci went on drinking. Soon he was drunk enough that his vision of himself no longer hurt. Nothing hurt. He could talk to these men without being ashamed or afraid.
>
> Prince of the City - Daley

> The Wordstar program on the Apple micro won't work because the CP/M diskette is incompatible with the Z-80 board . . . so access Stanford with the modum and use Wilber.
>
> Overheard conversation

Commonplace in the future will be social communication made up of multilingualism and technical languages consisting of binary codes and abbreviations. Technology and its accompanying transformation of language can be expected to eradicate social inequity and increasingly foster social and cultural respect.

Accompanying the changes in language and shift in educational focus will be modification in the curriculum.

Structured curriculum will give way to instructional modules, illustrated as in the following curricular contrast:

1983*	2058
English - II (composition)	Hierarchical Cognition
Spanish - II	Universal Binary Communication
P.E.	Transorganic Stimulation
Biology	Molecular Synthesis
Geometry	Oblique Factorial Analysis
History (Modern European)	Psychosocial Analysis

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*College Preparatory - 10th grade courses

Much of the future curriculum will be self-paced, allowing much more rapid completion of coursework and permitting accelerated progress.

Summary

The nature of the classroom, indeed every aspect of education, in the future will be beyond anything we can imagine today. The breadth of these can only be touched upon. In summary it appears that the future in education will be characterized by:

- A major shift from the product (facts) value orientation to more humanitarian (unification) orientation; consequently, education will become a resource network (i.e., use of data banks, peer learning, mentors, parents).
- A shift to greater participation of students in their own learning.
- Teachers assuming a role as learning brokers.
- Future classroom taking a seminar form.

- Education expanding (beyond traditional schools) via telecommunications to mass audiences, through apprenticeships and use of mentors.
- The transcendance of present sociocultural issues through recognition of varying social, cultural and language attributes as positive.
- Easier language communication via use of binary codes, instant electronic translation, holistic language learning and mental telepathy.
- A focus on processes and skills development (not facts per se) and development of higher order cognitive abilities.

In brief, the future of education offers a very real possibility of a "brave new world." It is only left to us to seize the opportunities.

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CAREER AND WORK IN THE 1990's:
A CHALLENGE TO OUR PRESENT EDUCATIONAL FOCUS

Janet Cameron Fisher

Entering the 20th century, over 80% of the population was involved in agricultural pursuits. The job market was heavily oriented toward supporting an agricultural economy. Even the public schools maintained this perspective. The September to June school year was developed not on the basis of educational research but only to allow students to work in the fields.

As the Industrial Age grew and the U.S. moved away from agriculture as its major focus, the work force changed so that by 1930 more were employed in industry than in agriculture. Overlapping these trends was the growth of the service economy; by 1980, 30% were employed in this sector.

Even more rapid in growth was the emerging Information Society. By 1980, 50% of all Americans were employed in information related careers, while those in agriculture had dropped to an all time low of 2%. It is estimated that by 1990, the Information Society will have captured 70% of the careers. The number working in heavy industry today will be reduced 80% by the year 2000 (Harmon, 1979). As a result of these employment changes, the coming electronics revolution, and the emerging biological revolution, careers will continue to show dramatic change. By the time current kindergarten

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children retire, perhaps 90% of the jobs that will be available then do not exist now.

The question has been raised as to whether or not the projected population of the United States will have the skills for the jobs of the future (Enzer, 1983). The competencies needed for these new careers will be much different from those emphasized by the current vocational curriculum. According to O'Toole (1983), "The worker of the future is not the manual laborer of the vocationalists' imagination, but a 'data communicator' with heavy responsibilities - both technical and moral - that require the judgment and analytical skills that are characteristic of the broadly educated person."

New jobs will encompass many areas and will reflect a myriad of technical advances. They will require workers with highly developed communication skills (listening, speaking), observation and measurement techniques, and the ability to analyze, make decisions, and solve problems.

The office of the future will require people skilled in the use of very sophisticated information systems. Office workers will have equipment which will replace the need for filing, stenography, and typing; they will need to be able to access the available information and make independent decisions.

Factory workers will no longer have to do the dirty, dangerous, repetitive jobs; the robots will be able to do those. Instead, most factory workers will be involved with installing, programming, monitoring, and repairing the robots, a specialty which will require very high level skills.

Cetron and O'Toole (1982) have suggested many future occupations in their article outlining their perspectives of careers in the 1990's. Some of the more intriguing jobs mentioned include those of housing rehabilitation technicians, genetic engineering technicians, holographic inspection technicians, and bionic-electronic technicians.

These changes that are occurring in the work role will impact heavily upon minority populations. Minorities have traditionally been under-represented in white-collar/high level skill jobs. Unless changes occur in the educational process, the gap between minorities and the mainstream population will become even greater. Minorities have been most often employed in blue-collar jobs but with the advent of the revolution in technology even those openings will require more sophisticated skills.

To prepare students for future employment, educators need to assess again the skills the students are now being taught. It is true that many specific skills in technological areas will be needed, but the most important tools that can be provided for youth are those of analysis, judgment, and critical thinking. Activities to develop these skills can be incorporated into any subject area.

Introducing a Futures Perspective into the Career Education Curriculum (1982) provides a series of lessons, K-12, which give the students opportunities to analyze and think critically about themselves and their future. Lessons include activities designed to develop future-focused role images, forecasting, short and long term goals, plans for achieving goals, and scenarios concerning future events. Other activities involve role playing and simulation games, such as Human Survival - 2025 (EDU-GAME, 1974) and "Improvising the Future." In this latter activity, seven steps are followed to assist students looking at the future:

(1) Divide into the following groups according to "age levels"

    (a) 8-11 years olds
    (b) 14-17
    (c) 20-23
    (d) 40-43
    (e) 60-63

(2) Assign each member of the group a distinguishing characteristic:

    i.e., 8-11 - bully or child-genius
    14-17 - cheerleader or unwed mother/father
    40-43 - Avon lady or truck driver
    60-63 - school cafeteria worker or legal secretary

(3) Each group selects one or two changes they would accept from a list of possible future events/realities in given areas:

    i.e.,Transportation - monorail system linking major cities
    Products - pill food, robot servants, unisex/unistyle clothing

(4) Tabulate results. Acceptances and rejections cancel out.

(5) Group interaction. Make deals or convince others to change selection.

(6) Retabulation.

(7) Improvisation: Projection 25 years ahead which focuses on the two items selected (accepted) in a particular category. Create a scenario.

Above all, in any classroom activity, opportunities should be created to encourage the students to analyze situations and make decision. Educators must be aware that the changing role of work will require changing the patterns of curriculum and instruction.

Students are in the future - the world of the future with all its new dynamics belongs to them. The educational task is to prepare them for a significantly different Twenty-First Century.

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GLOBAL SOCIETAL TRENDS AND THE NEW TECHNOLOGY: IMPLICATIONS FOR TEACHER CREDENTIALING

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The New Technology in Perspective

The excursion into future trends in teaching and technology begins with a brief look at some of the technological possibilities. Contemporary media and communication technology are expanding educational possibilities and, potentially, affecting the structure of educational institutions. The massive impact of media and technology in out-of-school applications make it an unavoidable fact of life for children and youth. Currently, media's greatest use is for entertainment rather than formal education and, unless its undeniable power is harnessed for education, there is a danger of seeing a world in which the trivial, magnified by technology, may overwhelm the substantive which lives in out-of-date scholastic environments.

School improvement can focus on (1) making current educational programs more effective, (2) bringing new content or teaching processes into the school and (3) creating new institutional forms for education, built around recent and emerging media and technology. The various media and technological forms can be brought to bear on all of these levels of school improvement. Designers of better education have to

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reckon with technology--consider its weaknesses--and search for the most productive ways of combining it with human resources. For the solution is not to pit people against machines but to use them in productive combination.

Technology, including the media of communication, teases with the possibility of creating new and more satisfying ways of life. It promises to stretch the possibilities for personal growth and common action. Seeking to solve the problems of our cities, computer simulation helps in the comprehension of complex processes and reduces them to manageable terms. Concurrently, technology frightens by increasing the potential for violence and social control. The tendency to violence, for example, is magnified by broadcast television as it indiscriminately searches for plot lines and dramatic episodes. Similarly, the mission to destroy the starship, or avoid being eaten by Pac-Man, causes many to pause and speculate on the social merit of the video game. In education, technology increases the potential for both good and bad schooling. Trivial content, taught in a more powerful way, becomes menacing. Unfair testing practices--standardized, automated, and authoritatively administered--become nightmarish.

To find ways in which communication and technology can enhance society rather than exaggerating its defects is one of the major tasks in education. The fact that powerful communications media technology has been developed that can affect all aspects of our lives is not an issue. Only the surface has been scratched in applying communications media and technology to education. Technologists in education generally feel that early efforts to use media and technology in the classroom have been relatively unsuccessful. Experimenters, however, have continued to expand educational possibilities through the development of open- and closed-circuit television, the creation of multimedia instructional systems, and the expansion of libraries into multimedia information storage and retrieval systems and the use of the computer as an instructional device.

Many of these newer technological developments have yet to touch the lives of the majority of students inside schools. One reason for this is that school environments have generally not been conducive to such developments. For example, most secondary schools are organized into sets of 45- to 50-minute time periods. Thus, educational films have generally been held between 10 and 20 minutes, which barely leaves time to orient the students to the film, show it to them, and then have discussion afterward. Such constraint not only affects the kinds of topics that can be treated but also results in superficial treatment of complex topics.

Despite some successes, closed circuit television has been very difficult to use in the classroom. As Guba and Snyder (1965) indicated, broadcast television paces instruction, requiring teacher and students to accept the flow of the broadcast medium. Teachers, however, had their own flow of instruction and never learned to incorporate the mediated episodes into their curricular patterns. More exotic uses of the media, in which constraints of time and organization are ignored, have been infrequent. Elaborate game-type simulation, for example, is barely used at all, although wonderful simulations are available. Effective use requires schools to change.

Many know of schools have storage rooms filled with instructional aides that were going to revolutionalize instruction. If the history of educational innovations teaches anything, it should be that the environment must accept, even embrace the change, and skill level--ongoing staff development--must accompany the change. The application of media and technology to education requires a general school design that both guides the development of alternative educational forms and creates a congenial institutional framework in which these forms can be applied. The structure of the school is in many senses the medium of instruction; it facilitates certain kinds of learning modes and inhibits others. If the new technologies, such as the computer, are not carefully woven into the fabric of the school, they too will find their way to the storage closet.

Teacher Preparation and Credentialing for the Future

The Commission on Teacher Credentialing is the California State Agency that is charged with the primary responsibility of establishing standards for the preparation of public school personnel (teachers, administrators, counselors, and other certified support personnel) in grades 12 and below. There are two activities that the Commission is engaged in that will have important and positive effects on the future of education in California. The first is the proposed reform of teacher preparation and certification and the second is the Commission's examination of role and impact of computer literacy in the preparation of teachers.

The reform package would establish a multistage credentialing process. The initial stage of preparation would lead to a preliminary teaching credential.

The second stage, called advanced preparation, is designed to provide teachers with the knowledge and assistance that the initial years of teaching require. The Advanced Teaching Credential is based on the following six principles and premises:

1. The Commission's concept of advanced preparation has been based on a recognition that the beginning years of teaching impose unique demands on teachers and that effective supports must be provided to new teachers as a result.
2. The concept of advanced preparation also recognizes that there are considerable differences from individual to individual in terms of skills, maturity and capabilities. Therefore, advanced preparation must focus on an individual teacher's needs.
3. Preliminary preparation cannot fully prepare teachers to meet the unique demands of the first classroom teaching job.
4. There are many experienced teachers and administrators who would be willing to help, counsel or guide beginning teachers.
5. Advanced preparation will concentrate on the teaching function by examining concepts of pedagogy, subject matter and techniques of instructional practice.
6. Advanced preparation recognizes that support for beginning teachers needs to be provided by appropriate advisors. New teachers have said that fellow teachers are the most helpful sources of ideas and

> solutions to problems. The Commission's proposal will make this assistance more purposeful and systematic.
>
> The Commission believes that its reform proposals will enable beginning teachers to receive the professional assistance they need from those most capable of giving aid at the time when it is critically needed.

In the third stage, experienced teachers would complete professional growth requirements to maintain the validity of their advanced teaching credential. The concept of professional growth is based on the following tenets:

1. Teachers must remain abreast of changes in society and in pedagogy.
2. The preparation of effective teachers is never complete and should continue as long as teachers practice the profession of teaching.
3. The ongoing validity of teachers' professional credentials should depend on continuing professional development.
4. Teachers should be able to pursue a rich variety of activities in the course of their professional growth.
5. Teachers should have significant roles in determining the course of their own programs of professional growth.
6. When the program and successful service are verified, the validity of the advanced teaching credential would be extended for another five years.

The proposed credentialing process is based on the genuine belief that knowledge and skills, colleagueship, peer assistance, and growth-producing activities ought to be at the center of the teaching profession and, therefore, the bases on which credentials are granted and extended.

The second issue on computer literacy relates to the Commission's desire to produce well-qualified teachers who possess the kinds of skills individual teachers will need for the end of this and the next century. The purpose of this activity is to determine what (if any) standards related to computer literacy should be established for the preparation and certification of future teachers.

The Commission is in the process of surveying noted technologists, educators, and leaders from business and industry. Although the survey is far from complete, there are some preliminary findings. Those surveyed seem to agree on two points. First, that there should be a differentiated view of computer using teachers. These teachers seem to fall into three groups. The first group is teachers of computing, the second is teachers using computer software in their traditional courses and, finally, computer literate teachers who assign computer programming and simulation projects in their courses.

Information gathered by the Commission suggests that there definitely should be standards regarding the preparation and training of the first group. This group is important not only because they will present the major computer instruction for students, but also because they potentially can be the source of instruction and assistance for other teachers and be the catalysts in building the technological base for the school environment mentioned in the first section of this paper. There was consensus (although not unanimous) that the training for the first group should be done largely through colleges or universities.

The second group (computer software users) ought to have training but probably not as rigorous as the first group. The State Teacher Education and Computer (TEC) Centers or other in-service offerings are the ideal place for this group's training.

The group of computer literate teachers represents a concern of the future. As the first group does its job, the third group will need to be developed. They will need to be relatively familiar with computers and know at least one language. Their training could be handled as advanced preparation or as a professional growth activity.

For both of these activities, it is felt that teacher involvement is critical in the effective implementation of changes in training and curriculum, and the continuation of such changes. If the schools social system cannot embrace these attempts to improve schools and teaching, there is virtually no chance of their success.

Teachers and Students and the New Technology: Social Implications and Cautionary Notes

All one has to do is open this morning's newspaper to read another round of criticism about the inability of the schools to prepare the nation's youth for the future. In the same paper, society's latest artificial messiah, computer technology, is touted as the innovation to save the schools. While these articles and similar claims have some justification for their conclusions, most of these fail to take into consideration the school's social context.

Connected to its social milieu, tightly clasped by tradition and yet the medium of modern ideas and artifacts, the school floats paradoxically in an ocean of social forces. Technologies strengthen the school's potential and threaten to replace it. Its personnel receive very little training but are asked to manage one of the most complex professional tasks in society. Teachers have little status but awesome responsibilities, both for individual children and for the health of society as a whole.

In this last section, the social implications of current proposals for the improvement of teaching and the increased use of computer technology in the schools will be examined. What the Commission advocates is looking at the future of teaching and technology with our eyes open--examining both the positive and negative features of any change. The history of educational innovations demands no less.

Starting with the Commission's own Credentialing Reform Package, it is felt that the proposals are well-grounded in the research on teacher induction and staff development. The assistance to beginning teachers will result in more job-focused skill acquisition and teachers will feel supported rather than abandoned during their early years. On the other hand, Advanced Preparation places additional demands on the beginning teacher, on those that advise the beginning teacher and on the system. Each takes on new responsibilities in a profession where there are already too many pressures.

The professional growth provision of the proposed reform package also has aspects that can be seen as either positive or negative. Some teachers will see the elimination of credentials with no renewal requirements and the proposed continuing education requirements as punitive. For some, this is probably true; the Commission hopes not for most.

We expect the professional growth provision of the proposed reform package to have differential impact on experienced teachers. For the already growing teachers, there is a desire to recognize and endorse the kinds of activities in which they already engage. Teachers should be encouraged to engage in analysis of teaching and to try innovative ideas. Meeting the minimum requirements for renewal will be of little consequence because, routinely, these teachers far surpass the standards. It is felt that the report form will be extremely simple, with the paper work requiring an absolute minimum of time.

For passive or more reticent teachers, the growth requirements will serve as a prod to seek out growth activities, to join with other teachers in activities and, hopefully by being a learner, become enthused about being a teacher again. For the more withdrawn teachers, and in some cases the reticent or passive teachers, the professional growth requirements would be a clear message that teacher preparation is never complete and should continue as long as a teacher practices the profession of teaching.

Moving now to the potential of computer technology and its implications it can be seen that, just as "Sesame Street" has forced many teachers to change the process and substance of the early grades, the computer can make significant changes in later education. It can teach students to think in new ways, it can provide completely new curricular vistas for students and teachers, it can offer educational opportunities to previously inadequately served groups of students (such as the physically disabled who are only beginning to benefit from the computers and microelectronic technology) and it can free the teacher from some of the more mechanistic aspects of teaching so that the teacher's role can be more creative and challenging.

With all of computer technology's potential, there are dangers that need to be researched within the social context of the school. So far, the use of computers in school has widened the gaps between the "haves and have nots" in our schools. For example, the current computer technology literature reports:

- three times as many wealthy districts have computers as poorer districts
- two to three times as many boys as girls sign-up for computer classes
- higher achieving students are taught to use the computer as a problem solver while the lower achieving students typically get programmed instruction units
- the press for excellence and higher graduation requirements will almost automatically lead to more tracking and ability grouping

Besides the necessary amounts of skill training, teachers need to be trained in both the potential gains and losses from the use of computer technology. Both the continued professional growth of teachers and the application of new technologies must be seen and applied within the social context.

Just as a computer requires connections among thousands of component parts, so too the process of schooling (and school improvement) requires the careful structuring of curriculum, professional growth opportunities, technology, and the social system in order to be successful.

ALTERNATIVE GRADUATION AND ENTRANCE REQUIREMENTS:

A HUMAN ESSENTIAL

Don Glines

High school graduation and college entrance requirements are once again a center of controversy in the United States. Reform is being advocated, this time toward what is hailed as a return to academic rigor. Somehow the notion has returned that by mandating more algebra, English, foreign language, and science, education and thus communities, corporations, and the United States as a whole, will be better.

The fallacy of such thinking has long been in evidence. Such approaches have been tried before without success. Systems that have worked well for many youth are being ignored and/or condemned as lacking quality and standards. The bandwagon effect has again taken hold; the domino syndrome is in operation. The ills of society and education are going to be corrected by requiring more of what has only been of some success for the select few. The controversy in California is illustrative of the national pattern.

When the new University of California and State University and Colleges entrance requirements, the model high school curriculum being considered by the State Board of Education, the proposed educational reforms advocated by the State Department of Education, the counter proposal by the Association of School Administrators, and the major bill by the Senate Education Committee chairman are analyzed carefully, it is not hard

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to understand why they are all wrong, when applied universally. The key word is ALL. If society as a whole understands the needs of some students, parents and teachers, if it is concerned about each person as an individual, and if the California process is open-minded in reviewing the research and the experiences of pioneer educators, it is unlikely that after considerable deliberation, such standards will be adopted for ALL.

It would be quite appropriate if the criteria for admission and graduation being suggested were seen as only one avenue, or one option, for those who voluntarily selected the path, even if at this moment in history the large majority opted for such mandates. However, as standards required for ALL, they can never stand the test of careful analysis. The only way they could survive is as Alternative One. The schools and colleges should also offer Alternatives Two, Three and Four at a minimum, and preferably several more. Students should be able to select the graduation and entrance patterns and criteria that best match their individual learning and living styles, facilitated by an instructor using an approach most suited to his or her pedagogical preferences.

Therefore, support for the conventional proposals and requirements now in existence, or for those being suggested is to be encouraged, but only if there is maximum leeway for students to succeed, graduate, enter college and adulthood through other alternatives.

The university system has proposed four years of English, three years of math, including algebra I and II and geometry, one year of science, two years of foreign language, one year of United States history (but nothing about the potential future histories) and one year of fine arts. The State University and College system proposal is similar except that only two years of math are required. The question is why? What significant difference will such combinations produce?

The State Board of Education has discussed a model for high school graduation for ALL students. It includes four years of English, two years of a single foreign language, three years of math (including two years of algebra and one of geometry), two years of science (including physical-earth science and biology), three years of social sciences (including one of world culture, one of U. S. history), and a semester each of U. S. government and economics, a year of visual and performing arts, and a semester of computer literacy. The question in why? There is not one shred of substantive research to support such requirements for ALL students. What research there is (most of it on both sides is inconclusive) supports the argument against such patterns.

The State Department of Education is expending efforts to increase the length of the school day and year for all students, to require English, social studies, math, science and fine arts combinations similar to the proposals cited above, to push for more homework and textbooks, and to insist on rigorous academic programs and discipline. All of this is tantamount to rearranging the deck chairs on the Titanic.

The California Association for School Administrators has, unfortunately, with only minimal debate, supported much of this effort. The Representative Assembly adopted patterns similar to the above proposals. They recommended a Basic Academic Core, and an Extended Academic Core. The former includes little new, other than focusing on competencies as well as courses. The latter echoes the State Board and even suggests Latin, but not Arabic. More of the same in a different package is not necessarily the answer. However, the majority decided that these are the acceptable educational patterns being demanded by the public (singular) and that many members of the Legislature will financially support them, as a result of hearing often from a loud minority in their home community (singular) and voting district (again singular). The California School Boards Association members were divided but they, too, finally decided to support the proposals for more rigid mandates of academic courses.

The chairperson of the Senate Education Committee presented a modified version of the State Board package. A little less rigorous, the proposal called for three years of English, three years of social studies, two years of math, two years of science, one year of fine arts and one year of computer literacy--or a demonstration of computer competence. The package was tied to school finance and reform in teacher tenure laws. Other more or less flexible options began to emerge from other legislators.

It does not matter whether these requirements are for California in 1984, for some other state now, or for the future. The requirements still need to be opposed by futures oriented curriculum developers and community leaders.

The reasons to oppose such proposals for ALL students are legion. There are many research studies and a number of books clearly providing the justification for opposition. The reason for supporting such proposals, if they are implemented as one option, one alternative, one set of criteria among several established for graduation and admission, is simple; it is the American way. The United States gains its strength from its diversity, from its pluralistic society, from providing choices for multiple learning opportunities, individualized curriculum and personalized approaches. The strength of the nation is sapped by uniformity, by conformity, by standardized mandates, except where health and safety are involved.

There are very few things that everyone has to do or must learn. Most relate to health and safety. There are many things that are desirable to know or to be able to do. Perhaps there are some things that a number of people should know. However, there are other things that only a minority need to consider. Finally, there are items that only a few really need to know, be able to do or even find desirable.

Examples of the flaws in creating the same standards for ALL are well-documented. A summary of a few indicates that the opposition is based upon years of research, experience, philosophy, opinion and experimentation.

The born again university requirements have been in place for decades. They did not make sense before and they do not make sense now. Cries of unprepared students have filled the media for many years--even in the heyday of traditional education. It has been known for a long time that two years of a foreign language, studied fifty minutes a day with homework, for two nine-month periods, only produces illiterates. If fluency in a foreign language is desirable (and thus required) and opportunities to be immersed in the language and culture are provided even in conventional schools, then the requirements of a foreign language might make sense. As it is, the two years are a waste of time for most students; they prove nothing in terms of academic ability for many college majors.

Algebra is an obsolete course, especially the way it is taught in conventional schools, and so is geometry, in this electronics revolution era. However, if algebra is to be required, why for one year? The math gifted students can learn it in six weeks. Give them some materials and get out of their way. Others can handle algebra if studied for fifty weeks. The thirty-six week year is inappropriate for most students. Many need less time, others need more. Why are the proposals calling for one year of algebra, one of geometry, and one of algebra II, when these courses have practically no value for many students. They do not train the mind, they do not assist nonmath oriented people in later life and they do not contribute to being a successful parent and a beautiful human. Why not require Latin? It makes just as much sense.

Another year of English does not automatically improve the ability of students. Many can write well at the college level by grade nine. For those who cannot write well, then help them write. Thirty-six weeks more of Silas Marner and Julius Caesar is not going to make a difference. If the students received a D in 7th grade math, the student will not be able to do 8th grade math. Usually it is a similar course, only the textbook is a different color. If the student does poorly in 11th grade English, another year of more of the same generally does not lead to significant improvement. If the student already does exceptionally well in English in the 11th grade, there is no need to require more.

Homework follows the same pattern. Those students who understand the material do not need to do more of it at home. Those who do not understand it in school, should not do it at home. They become frustrated, they meet failure, the family may be upset, the work is not done or is copied from someone else. Such lack of success and boredom are key factors in alienating youth from school.

By the end of the eighties, over 50% of the school population of California will be comprised of minority ethnic groups. These students can and should learn as well as those from Anglo homes. However, there are cultural and language factors which make required of all an ill-conceived banner. It has been illustrated over and over again that it is the affective domain, not the cognitive, that is the base of school success. More math is not the answer. Quantity does not replace quality and relevancy.

Currently, some students of all ethnic groups are classified as gifted and talented and do well in school. They are generally bored with their classes but they succeed well by conventional standards. Others are of the same ability but have given up fighting a system that does not provide the opportunities essential for their development--the extreme right brain arts oriented student in an extreme left brain academic school.

There are students who are in-school dropouts; they get C's, a few B's and D's, they stay in school but they are not excited. Then there is a group of discipline-problem students, by traditional standards--the turned off, antisocial, seemingly always-in-trouble-individuals. Finally, there are the less capable students--great youth, but just not too sharp in academics called French and chemistry--not to mention the other group of youngsters still negatively labeled "special education." Will ALL these six groups automatically benefit from more math, more homework, more English taught in the same conventional school structure with textbooks, 30 desks facing the blackboard, 50-minute periods, report cards, and more and tougher tests?

The Eight-Year Study of the 1930s (Adventure in American Education Series, 1942), which has been conveniently overlooked by the various fractions shouting that they have the answers--that all students need to meet the same minimum standards--was a landmark curriculum review. The results were coded into five volumes of data from 30 of the best high schools and 300 of the best colleges. Staffed by excellent researchers, the study verified that it does not make any difference what courses students take in high school related to success in college and success in life. In fact, the students who deviated the furthest from the conventional norm proved to be the most successful in the follow-up studies.

These results were supported by the Ohio State Laboratory School during the eight-year study. Two books about the students, We Were Guinea Pigs, and Guinea Pigs: Twenty Years Later (Willis, 1961) showed that the graduates of this "crazy" program were significantly more successful, when evaluated by conventional criteria, than were their peers in the traditional schools.

In the seventies the Wilson Campus School of Mankato State University, Minnesota, confirmed the Eight-Year Study (Glines, 1980). Students from K-12 were mixed together with no attendance requirements, no courses, no traditional schedules, no report cards or homework, or no graduation requirements; they had the option of taking all the experiences they desired, in whatever fields, learned in a personalized, individualized setting, with other students and adults they selected. This truly innovative, highly successful program for youth was described in several national journals as the most successful experimental school of its time in America.

Why have not the proponents of academic rigor, and mandated-for-all-standards, tried to understand the lessons from the Eight-Year Study, from Ohio State, from Mankato? The Wilson students were graduated when they were ready, without grades, class rank, Carnegie units, credits and courses (such as four years of English, three years of math, et al.). Yet they learned, they behaved, they got jobs, they performed volunteer social service, they got married--and those who chose entered the best universities in America--without all the traditional badges of courage.

Mankato State even had undergraduate and graduate university programs that operated in a fashion similar to Wilson. Yes, at the college level, too, students were successful in learning and succeeding, at traditional honors levels, through nontraditional modes and requirements.

If there are to be specific mandates, then why not require home economics? Departmentalization should be eliminated in schools, but if departments are retained, home economics may be the most important. Not traditional cooking and sewing but child growth and development, nutrition, health, safety, interpersonal relations--the really important basics in life. Since when is child growth and development nonacademic or nonrigorous?

Yet home economics is not mentioned. Neither is industrial arts, business, physical education or other important fields. Drama, art, and music are only given lip service--one year of fine arts. What research is there to support the notion that three years of math, especially algebra, is more important than three years of fine arts for ALL students--for high school graduation--for life pursuits--for college success? Since when is a course in economics more important than futures studies? Again, a topic not even mentioned.

The emphasis on reading and math in the first grade for ALL is just as erroneous as four years of English for ALL at the secondary level. Students soon develop trouble in school as a result of underdeveloped maturity and motivation factors, yet ALL students are supposed to have a basal reader. Why? Many students should NOT be reading in first grade and many students should NOT have math in the 7th grade.

The world appears to have already moved into the beginning stages of the greatest transformation in the history of humankind. The Twenty-First Century may be dramatically different. It could be doom and gloom or a golden age, depending upon the decisions being made now. Schools should become extinct in not too many decades. Electronics, compassion, changing lifestyles, human values, global dilemmas, and new technologies will force a new learning system for a New Age. Education is already moving into a transition--from schooling to learning. The old requirements, standards, methods, courses, patterns, and structures of the Industrial Age are no longer appropriate for the coming years.

Therefore, the same standards, requirements or courses at the elementary, secondary, and university levels are no longer justified. There must be choices. People can become beautiful, well-educated humans without algebra or without an extra year of English. Some learn and mature better through fine arts or health oriented experience, each of which can be of high academic quality.

The present solution to the dilemma of what to require is to provide a minimum of four criteria approaches for graduating from high school and entering college. These are all equal in stature and standards in preparing youth for university, work, or other life pursuits.

Option 1: A student may take four years of English, three of math, two of foreign language, two of science, three of social studies, and one of fine arts, along with similar electives. When completed, he or she graduates and is eligible for the universities or the world of work.

Option 2: A student may take some of the above courses but may prefer to substitute some art and music for algebra, or a different format in math. The student can show proficiency in English in less than four years and can count home economics. When completed, he or she is also graduated and is eligible for the universities or work.

Option 3: A student may design his or her own learning experience with no specific requirements or report cards. The students spend a great deal of time in the community. They present a portfolio to the university or to the employer. They too are prepared for college and adulthood.

Option 4: Those students and parents not satisfied with the other three options can create their own pattern of experiences through negotiation with their high school graduation review committee. They negotiate with the university for entrance and with the employer for work. They demonstrate that they have achieved and are prepared for work, life and/or college. They have done it through a route that may be popular with only a small percentage, but that route is highly significant for the present and future life of the youth involved.

Such approaches have been piloted. They do not cost any more money, can be voluntary and do not need to break State laws. They conform to a win/win philosophy of Options for All (in order for me to win, you must win), rather than win/lose (in order for me to win, you must lose) spirit which mandates that, for example, ALL students will attend school from September to June.

The adoption of single standard graduation and admission requirements in California would move learning backward. Optional, alternative choices for graduation and admission would move it forward. The nontraditional forms need not be less rigorous, of less quality or of inferior standards. They can be evaluated and can be even tougher than the traditional. They do provide for different family and study styles.

Of the four graduation/entrance options offered, it would be fine if 45% chose Option 1, 35% chose Option 2, 15% chose Option 3 and only 5% chose Option 4. At this moment of societal and educational transformation, those percentages are acceptable. By 2004 the figures may be reversed.

The diversity of humans in a community, many of whom have common goals but multiple ways of reaching them, clarions the call for more alternative schools, programs and colleges in the eighties. The original philosophy of options was that of a variety of well-accepted choices for ALL. There was no such concept as a regular school or university with an alternative to the regular if the student did not fit. The plans provided for several programs in a district, each enrolling a share of the student. All of the choices were equally praised, equally supported, equally funded, and equally publicized. The approach a student chose was his or her regular school. The design has worked beautifully in the few communities that understood the philosophy and correctly implemented the mechanics.

Each program was established to include students traditionally awarded A through F, all ethnic groups--a true cross-section of the community--with involvement in interschool sports, governments, bands, if desired, and all with proper facilities. They were designed for all levels: elementary, middle, secondary and university. They could be separate schools, schools-within-schools, colleges within universities, community learning centers, or the other 20 possibilities. The world was the classroom for those who chose it.

Alternatives, or a choice such as #4, were not seen to be for dropouts, problem students, less capable students, unwed mothers, racial segregation, or something to try when the regular program failed. All options were highly publicized and clearly explained. The student was not put in a program which did not fit. There was no intent to provide a lesser curriculum or to skip basic human skills, knowledges, and values. Rather, they were to be expanded, learned in a different environment, with more flexibility as to mandates, with more concern for mandates, and with more concern for motivation and maturation.

The current effort to return to basics has done its best to eliminate alternative choices, for the sponsors of the traditional modes think they know best for ALL students. They have succeeded in reaching the majority vote level; though they give lip service, and allow small alternatives, such as continuation schools, independent study, and pregnant minor programs. They have managed to hold the enrollments in such alternatives to only one percent of the California youth (Alternative School and Program Survey, 1982).

A variety of opinions, surveys, articles, straw polls, studies (Jennings and Nathan, 1972) indicate that probably 85% of the students would benefit from other than the present grade level curriculum mandates. There are parents who are professional educators. They have read the research, have read about or participated in the experiments of the 30's and 60's, and have concern about the future preservation of the biosphere and humankind. They want their children to read, but when they are ready, and often through different approaches. They are good citizens, are taxpayers and they may be in the minority. Do they have to submit to the course requirements desired by others who have similar interests and backgrounds but who believe in mandating the same conventional courses for everyone?

There is no longer a singular public, or community, or district. There are plural publics, communities, districts. The communities are split in their opinion, 30-40-30. A longer school day/year does not help ALL. The four-day week schools have removed that myth (Office of Rural Education, 1981). It is now time to defuse the graduation and admission myths.

The future is there to create. It is time to heed the advice of Willie Wonka, who so clearly said: "It is time to make dreams out of realities and realities out of dreams; it is time to be dreamers of the dreams." It is time for educators to consider more human options in the fumbling process of graduation and admission. It is time to realize that society is about to enter the Twenty-First Century.

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STUDENT HUMAN POTENTIAL: GOING BEYOND THE BASICS

Sylvia Ann White

The expansion of human potential and the accompanying increase in self-esteem and self-actualization is the key to emotional and physical health, social relations, learning problems, self-discipline, and future survival. The humanistic psychology of Abraham Maslow shows that lower level needs relating to pure survival must be met before an individual or a society can attend to higher level needs and, ultimately, the need to become self-actualizing. Up to the present time, the concern of humankind was with survival: the cavemen and the dinosaurs; knights and dragons; civilization and barbarians; haves and have-nots. The higher level needs of self-esteem and self-actualization could not be considered until now. The human overendowment of brain and body processes and capacities was not needed before. American poet and clergyman Thomas Merton has said, "What we have to become is what we already are."

One of the more concrete arenas of human potential expansions is in health and longevity. Health has a direct affect on human potential: Unhealthy people do not function at their maximum potential. Life expectancies are increasing and research in aging indicates that humans will reach their biological natural lifespan by the twenty-second century--a lifespan of about 120 years. This is about ten to twelve times the age of puberty, which is the proportionate lifespan seen in

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other animal forms. Children born in the 1980's may well live to see the year 2100.

In the twenty-first century, preventive medicine will be one of the fastest growing medical specialties. An important aspect of preventive medicine will be that of self-knowledge. One method of gathering self-knowledge is through the study of moods. An organized study of one's moods will provide the person with data to know what time of day the physiological state is at its optimum, what kinds of disturbances create anxiety and disrupt concentration, and when it is best to do demanding, difficult work, or when one should run errands, sharpen pencils or go for lunch.

Self-knowledge can also be obtained through biomechanical devices. Information can be fed to a computer and a projection of the individual's state can be obtained. If sufficient data is accumulated and analyzed, a baseline state for the next few hours can be predicted. Projections could then be made to allow an individual to consider the effects of various conditions on physiological and psychological functioning -- conditions such as drinking coffee, consuming alcohol, using drugs, playing tennis, watching television, meditating or sleeping.

Self-knowledge obtained through record keeping and through biomechanical measurements could enable teachers to study their moods during class, administrators to know when they are apt to get impatient or angry with staff members, drivers to know when judgment was poor, or students to know when to take a test.

Self-knowledge will enable everyone to recognize when they are experiencing stress and anxiety and can help them to get through each day more calmly. Stress and anxiety are problems endemic to modern society. Their cumulative affect is made worse when we ignore them. Lower level biological needs, such as anxiety, hunger or nagging pain motivate a person to attend to these needs. However, consciousness can ignore these messages so that a person can confront external life and death issues. This capacity is overused in modern living and results in the prevalent societal diseases of migraine, ulcers, heart disease and other signs of stress. Meditation and techniques of progressive relaxation help a person to relax and to become aware of body tension.

The physiological and psychological benefits of Transcendental Meditation have been well-documented and include changes in metabolic rate, decrease in oxygen consumption, decrease in blood pressure, more rapid recovery from stress, relief from insomnia and changes in brain wave patterns. During higher level cognitive processing, when a person is mentally alert, the brain is producing Beta waves, which measure 14 to 30 cycles per second. During meditation, Alpha waves are found, which measure 8 to 13 cycles per second and indicate brain idling. Brain production of Alpha waves for one or two minutes a day can add twelve to fifteen years to a person's life. The basics of education in the future might well include the gathering and application of self-knowledge and techniques of relaxation and meditation.

Increases in knowledge about brain chemistry will bring changes in human potential. The isolation and understanding of brain proteins and hormones is pointing toward possible development and availability of positive drugs. These include a nasal spray to enhance memory, hormones to increase attention span, drugs to heighten creativity, brain proteins as a cure for drug addiction, a more effective treatment for epilepsy and treatment or elimination of many forms of schizophrenia. The study of the brain is showing that emotions are coded in brain chemicals. To think of emotions as merely chemical reactions may make humans seem less human but it also makes the design seem more marvelous.

Neurobiologists are showing that aggression has a chemical basis and that violent behavior can be controlled by restoring the balance of the brain's chemicals. Early environment and experiences have an influence on biochemical balance. Repeated childhood experiences of aggressive behavior may result in conditioning the body to produce more of the hormone that is present during aggressive acts. Ethical issues prevent application of some of the studies of brain chemicals but the research does present increased understanding of human behavior, with implications for expanding human potential in new ways.

Recent studies of altruistic behavior have indicated the possibility of a sensitive period for the development of the emotion of empathy, corresponding to the maturation of structures in the limbic and frontal lobes of the brain. The more primitive reptilian brain governs the ritualistic and hierarchical aspects of life but the more recently evolved limbic brain governs the emotions and altruistic aspects of life. Evolutionarily speaking, humankind should evolve into more altruistic beings. The compassionate, altruistic qualities of humans are syntropic; the selfish qualities are entropic. Humankind is in the universe for its syntropic functioning.

Even more revolutionary than studies of brain chemistry are studies of the mind. This is the beginning of the golden age of brain, mind and body research. Until now, the conscious receptors have not been educated to take in the total amount of information and the multiple levels of knowing and feeling of which humans are capable, and that are needed for modern decision making. When people cut themselves off from their sensory being, they cut themselves out of the moral flow of the Universe and lose their capacity for empathy.

Mind research has included studies of accelerating mental processes. In an Accelerated Mental Process, a person learns to utilize the brain's ability to process millions of images in just microseconds and to increase the rate of thought and the amount of subjective experience beyond what is ordinarily possible within a unit of clock-measured time. Imagery is important in this process. A human being has a natural capacity to think in images as well as in words. There is a widespread capacity for imagery in young children. The present emphasis in education on verbal processes inhibits the capacity to think in images. Fortunately, this capacity can be reactivated. Implications are that skills and learning can be increased through practical use of imagery and of the Accelerated Mental Process state. This could range from five minutes to several hours of practice a day. Another basic of future curricula will be training in the use of imagery and Accelerated Mental Process.

Sustained creativity is prevented when thinking is done only through conceptualization. Concepts get in the way of percepts. Some of the most creative conceptualizers are also the finest perceptualizers; they have kept the sensory refinement of childhood and have extended it into their adult years. Sensory acuity and perception is increased through relaxation and imagery. Learning must occur as a total body experience. The brain takes in more information than just perceptions and sensory data.

Most people presently use only about ten percent of their physical capacity and five percent of their mental potential. To be a planetary person in the world of the future means to be part of a wholly different modality of knowing and being. Psychophysiology is the meeting of Eastern and Western thought through the study of the integration of the body and the body image. People living in today's urban societies decline in physiological use of their bodies by about 75 percent between the ages of three and seventeen. With this disuse of the body comes an inhibition of the motor cortex and, therefore, because of the diffusion phenomenon of the brain, a parallel inhibition of thinking, feeling, knowing, sensing and learning. In the body dynamics of psychophysiology, body awareness increases through movement experiences. When there is an increase in body fluidity and the person is learning, learning will occur much more rapidly. Psychophysiology is another basic for the curriculum for maximizing human potential.

Interest in psychic experiences and mysticism is moving into the realm of science and education. Metapsychiatry is the interface between psychiatry and mysticism and identifies common grounds for research. It includes the study of extrasensory perception, telepathy, biofeedback, voluntary control of visceral states, biocycles, energy fields, kirlian photography, the physiological and psychological effects of meditation and other altered states of consciousness, and atmospheric effects upon behavior.

In a recent survey of psychiatrists, 31 percent indicated that they believed strongly in psychic manifestations, and an additional 48 percent indicated an acceptance of the possibility that they could exist. Psychiatrists and directors of medical schools supported the idea that studies in metapsychiatry be included in psychiatric education.

Transpersonal psychology is the study of transpersonal experiences, or experiences which extend or go beyond the personal or the individual. A study in the field of social sciences revealed that 35 percent of the persons surveyed reported having had experiences of feeling close to a powerful spiritual force that seemed to lift them out of themselves, and half of those persons reported having had such experiences often.

Western futurism has suffered from the lack of metaphysics. Transpersonal psychology has shown that the innate capacities of the average human have barely been tapped. Too many persons in the Western world are not yet familiar with the emerging post-Newtonian image. The scientific world is presently involved with a paradigm shift from Newtonian physics to Quantum Mechanics. Newtonian physics was concerned with tangible physical matter, objectivity and certainty. Quantum physics theory abolishes notions of fundamentally separated objects. It involves the concept of all humans as participators rather than observers. It views the universe as an interconnected web of relations whose parts are defined only through their connections to the whole. This scientific model may well serve as the new cultural model. Most Western thought has had no sense of *a priori* external laws to serve as a guide.

Evolutionary futurism involves the theory of change and applies principles of evolution to the study of the future. The process of evolution is predictive--it has moved from molecule to cell to animal to human. The evolutionary perspective shows that quantum transformations are traditional in nature. Incremental changes are punctuated by sudden jumps; evolution proceeds by sudden changes and by quantum leaps. Crises precede transformations; a system crisis stimulates a massive innovation. Positive innovations speed up at the time of a systems change. If one member of a species learns a new behavior, the causative field for the entire species is changed. The morphic field eventually becomes so saturated that one more individual acting in a certain way can change the whole field, affecting all members. A holistic unconsciousness is created and, if just one more individual changes, the whole field of consciousness changes. In evolution there is an inherent tendency toward higher consciousness, freedom and order. Nature evolves whole systems out of separate parts by the natural tendency to cooperation and synergy. As networks connect, there is a synergistic flip of the social pattern to a new, more complex order.

Human nature is evolving and the nature of nature is to increase intelligence. Single cells in the earth's early seas formed multicellular organisms, fish came onto the dry land, and humans are reaching into both inner and outer space. Consciousness has risen at every step intellect, individuality and intuition fuse to form a higher stage of consciousness and human consciousness can be aligned with the intelligence that is creating the universe through love of each other as integral parts of the same creation.

Change begins with first bringing about change in the individual selves and next through contacts with others; individuals create networks, networks join and a quantum leap is made. Humankind is at the stage of networking, before the quantum leap in its own potential. Educators must form one of the key networks or they will disappear with the dinosaurs, the dragons, and the single-celled organisms of earth's early seas.

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RESOURCES FOR THE FUTURE

Don Glines

There are over 5,000 individual items--books, articles, audio and video tapes, films, classroom kits, materials from information groups, magazines, and games--that could be listed here related to futures-oriented in-service and classroom instructional activities for teachers, students, and communities.

One of the best immediate sources for beginning a search for futures in-service assistance is the World Future Society, 4916 St. Elmo Avenue, Bethesda, Maryland 20814. They have available a major book service, tapes, film lists, annotated bibliographies, study guides, a directory, conference locations, games, and consultant references. Their monthly annotated publication, Future Survey, which reviews futures-related writings, is considered essential reading by most futurists.

An excellent catalog of futures curriculum selections can be obtained from the Global Education Associates, 552 Park Avenue, East Orange, New Jersey 07017. A contact for human resource assistance is the Global Futures Network Directory, recently published by the Global Futures Network, 26 McGill St., Toronto, Ontario, Canada M5B 1H2.

Once a search of futures studies is undertaken, one discovery leads to another, until soon more information and

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materials surface than can immediately be utilized by most school districts. The effort is stimulating and rewarding. Following are a few suggested starting points, in six different categories, for selecting in-service and classroom items for use in the 1983-84 school year:

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